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THE PRESENT STATUS OF EXPERIMENTAL RICKETS

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In the year 1650 Francis Glisson published the first adequate description of the disease which is still commonly known as rickets (1). The condition had appeared in the counties of Dorset and Somerset in England about thirty years previous to his writing and had been called "rickets" by the country people. They derived this word from the old English verb "wrikken," which means to bend or twist. Even though the name was very expressive of the bow legs and other deformities which follow rickets, the term did not satisfy Glisson. He christened it "rachitis," a word which he derived from the Greek words for spinal disease. Rachitis is the name which many doctors use for the disease today.

As a matter of fact rickets was really no new disease in the 17th century. We know that children must have had it in England before the Romans came. One skull of a child who lived in the bronze age has been found which shows definite signs of rickets.

Rickets can appear in infants as early as the third month of life, but there is at present no good evidence that they are ever born with it. The disease usually manifests itself at any time from the sixth to the twenty-fourth month. Although it is usually a disease of infancy there are many cases where "late rickets" attacks older children and even young adults. Almost all premature children develop the disease. Children with rickets are usually fairly well grown and appear to be fairly well nourished.

Rickets is a disease which affects the entire body although the most noticeable signs of it are seen in the bones. At the beginning of the disease the children are usually constipated. They are restless and irritable and their sleep is troubled. Frequently a rachitic child rolls its head about on its pillow until the hair is worn off from the back of its head. The muscles are lax, the tendons and ligaments may become elongated. Because of this as well as from the softening of the bones the children do not walk or stand at the proper time. The muscles of the intestines are affected as well as those of the legs and arms. Because of the weakness of these and the muscles of the abdomen, pot belly develops.

As the disease goes on the deformities of the bones begin to show. The first of these to appear is the "rickety rosary," or a line of knobs on the sides of the chest where the bone of the ribs joins the cartilage. The walls of the chest are drawn inward every time the child breathes, and grooves are formed on either side along the line of attachment of the diaphragm. The chest becomes compressed from side to side and pigeon breast deformities develop.

Bosses of new bone are formed on the sides and front of the skull and the head acquires a square shape. The ends of the long bones of the extremities become enlarged so that there is a swelling of the wrists and ankles. The legs become knock-kneed or bowed. The bones of the arms bend. Curvatures of all sorts appear in the spine.

Some children show very severe anemia during the course of the disease, and some manifest extreme nervousness, even convulsions. Rickets may be fatal by itself, but usually the child dies from some complication (2). The disease contributes very markedly to infant mortality because it renders infants suffering from it extremely susceptible to other diseases and weakens their resistance to any disease they may acquire.

Children with rickets are constant sufferers from colds and bronchitis and life is frequently destroyed by pneumonia, which is the result of these conditions. The severity of the complications is partly because various organs of the body are interfered with by the bony deformities and partly because of the weakness of the organs themselves. Finally rickets interferes very seriously with the growth of the child and children may actually become dwarfs because of it.

EXPERIMENTAL RICKETS

One finds many references in the literature of the past few years to attempts to produce in animals by various means the disease commonly known as rickets. Although much research has been directed toward the solution of this problem, the experimental diets employed were not so planned that the results could be accurately interpreted. A single example of the type of experiment planned with this end in view will serve to illustrate the point at hand. Dibbelt (3) sought to produce rickets in dogs by feeding them a low calcium diet composed of horse meat, carbohydrate (rice starch), and sodium chloride. This diet is low in calcium, to be sure, but there are several other factors which contribute to making it a poor diet. It is low in all three of the well known vitamins, viz., fat-soluble A, water-soluble B, and water-soluble C, and also in the new vitamin which will be discussed later. Its inorganic content is not so adjusted that the results could be said to turn only on the shortage of calcium. Even if the dogs had developed rickets one could not have said that the condition was due to the absence of calcium, although this would have been the interpretation put upon the experiment.

It will be recalled that it is only since November, 1915, when McCollum and Davis published their papers on "The Essential Factors in the Diet" and "The Dietary Deficiencies of Rice" that it has been possible to plan an adequate diet for the rat and know why it was adequate (4).

The importance of the aforementioned papers in this discussion is that prior to their publication it was not possible to name the different factors necessary to make a diet physiologically complete. They paved the way for the "biological analysis of foodstuffs", the results of which have enabled one to inspect a mixture and predict its shortcomings, and the additions necessary to induce growth. In other words, McCollum and Davis demonstrated clearly that the "chemical analysis of foodstuffs" must be replaced by the "biological analysis" if progress in nutrition was to be made.

One must bear in mind that in experimental work of this kind a working hypothesis is necessary, as it aids in drawing deductions from data with an understanding which is not otherwise possible. If, however, new dietary essentials are to be discovered one must deviate from the established formula and inquire whether under any dietary conditions the first hypothesis breaks down. If the hypothesis does not hold under the new dietary conditions, wherein do these differ from the conditions under which the hypothesis did hold? It is by some such procedure that new discoveries are made.

Prior to 1918 Dr. McCollum and I had seen gross changes in the bones of many of our rats, which were very suggestive of rickets. Realizing that gross changes were not sufficient to determine the presence or absence of rickets we merely kept tract of the various diets upon which these changes occurred. Not knowing what factors were involved in the causation of rickets and not knowing which of the changes were rickets, it was deemed inadvisable to even venture a guess as to the etiology of this disease.

When the co-operative study with Dr. Park and Dr. Shipley was begun, they found that many of the bones presented the typ cal histopathological picture of rickets, whereas some of the bones showed rickets-like changes, and other bones showed conditions which were in no way related to rickets. Typical rickets was found in animals fed diets which varied greatly in their composition. It seemed at one time almost impossible to run a connecting thread through the various diets upon which rickets did develop. The question may be asked, what are the characteristics of a rachitic bone? It is impossible in most instances to tell a rachitic bone except from h'stopathological sections. A rachitic bone has the following properties: (a) calcification of the provisional zone of cartilage does not occur; (b) cartilage cells persis' in the shaft below the normal epiphyseal line; (c) there is irregular invasion of the cartilage by blood vessels and connective tissue; (d) newly formed preosseous tissue remains uncalcified and is produced in abnormal amount —the so called osteoid tissue; (e) there is present the rachitic metaphysis which is composed of blood vessels, isolated masses and tongues of cartilage, connective tissue, and osteoid (5).

The degree to which a rachitic bone will show all of these characteristics depends upon numerous factors. If the rickets-producing diet is one on which the animals do not grow to any extent the condition is less marked, whereas on a diet which will induce some growth the picture may be exaggerated. One of the greatest problems which had to be met in investigating the etiology of rickets was the ruling out of diets upon which the animals did not all perform alike. If the diet used induced very little growth in the animals many of the bones presented only a mild grade of rickets, although some would show very pronounced rickets; in other words the results were inconstant. When one is working with diets which do not induce much growth but always early decline, there is a great tendency to cannibalism. This is especially true of diets low in fat-soluble A. After the eyes have become sore and the animal debilitated a rat is often destroyed by his companions. This was a most disturbing factor in our earlier studies on experimental rickets.

Mellanby was the first to associate the group of fats rich in fat-soluble A with the prevention of rickets (6). His work focused the attention upon the problem as to whether fat-soluble A or some other factor associated with certain fats was essential for bone growth. Mellanby worked with dogs. Whereas some of his data were suggestive that fat-soluble A was essential for bone growth, some of his results indicated that perhaps another factor was needed which was not identical with fat-soluble A. He did not prove or disprove this point. This is true for the reason that in many cases Mellanby did not appreciate the importance of the calcium phosphate ratio in the study of rickets. Thus he added meat to diets low in phosphorus and prevented the animals from having rickets by thus raising the phosphorus, but he attributed the prevention to the fat which he had added (7). Many of Mellanby's deductions were apparently drawn from X-ray photographs instead of from histopathological studies. As has been pointed out, the diagnosis of rickets can be made only from the latter studies, since both the X-ray pictures and the clinical appearance of rickets may result from an osteoporosis or sclerosis, which is in no way related to rickets in children (5).

Since most if not all rachitic bones show great deformity, many investigators were inclined to the view that the diets planned to induce rickets in animals must be low in calcium. Since an animal does not grow to any extent in the absence of calcium, animals fed such diets did not always show typical rickets. Many animals fed diets very low in fat-soluble A but containing an abundance of calcium showed typical rickets, whereas some presented rickets-like conditions. Since bones are composed of both calcium and phosphorus the question of the relation of phosphorus to bone growth soon became appreciated. One of the greatest advances in the study of this most interesting condition was the demonstration by Sherman and Pappenheimer (8) and by ourselves (9) that diets containing calcium and phosphorus in certain ratios even in the absence of fat-soluble A do not cause rickets to develop. The bones are not normal, since a condition of osteoporosis results. This point has been discussed in detail elsewhere (9).

It has been known for about a year and a half that the main factors involved in the etiology of rickets were faulty relations between the calcium and phosphorus—either a low calcium and a high phosphorus or a high calcium and a low phosphorus (10)—and the shortage of an organic factor associated with certain fats (11). It has also been known that if the three factors are lacking, rickets will not develop or is very irregular in its development. The question which could not be definitely proved or disproved was whether or not this organic factor was the same as fat-soluble A or whether it was a different factor having a similar distribution. We were in possession of data secured with our "line test" diet which has been discussed elsewhere (12) that butter fat was very inferior to cod-liver oil in causing the deposition of calcium salts in a metaphysis free from calcium. This fact in itself suggested the existence of a new substance but still did not rule out the possibility of merely a difference in concentration of fat-soluble A. In other words, did cod-liver oil only contain much more fat-soluble A than butter fat? To quote Pasteur—"In experimental science it is always a mistake not to doubt when the facts do not compel you to affirm."

It should be pointed out that in diets where the calcium and phosphorus were furnished in about the optimal amounts as far as we know them for the rat (calcium 0.64 gm. and phosphorus 0.41 gm. per 100 gms. of food) we could not detect any difference between the potency of cod-liver oil and butter fat. It was only when one or the other of these elements was low that cod-liver oil was more effective than butter fat in causing a more efficient utilization of the element available. We were convinced that existing methods were not sufficiently critical to solve this perplexing problem. We sought, therefore, to attack the problem from various angles and see whether or not we could answer the question beyond doubt.

EXPERIMENTAL PROCEDURE

Making use of our experience with different types of diets in relation to rickets as well as ophthalmia we formulated a plan which involved a comparison of a selected list of fats in respect to three kinds of effects in nutrition. It may be stated again that we knew from previous experience that cod-liver oil was much more effective than butter fat in promoting a better utilization of a low calcium supply. This observation was one of the reasons for suspecting that cod-liver oil furnished a factor in abundance which butter fat contained only in small amounts.

Our plan of testing a series of fats consisted of the following:

1. We tested cod-liver oil, butter fat, shark-liver oil, burbot-liver oil, and several vegetable oils including coconut, maize, olive, sesame, and cottonseed, for their potency in causing the cure of ophthalmia due to lack of fat-soluble A.

2. We made up a diet which was so *low* in calcium that this was the limiting factor. It contained sufficient fat-soluble A to prevent ophthalmia. The problem at hand was to see which fat contained some substance which would make for greater efficiency in the utilization of calcium than could otherwise be effected in its absence.

3. We prepared animals for our "line test" by feeding a diet containing a *great* excess of calcium, and then tested out these different fats to discover their relative values for inducing the deposition of the line of calcium salts in rachitic bones.

When little rats are placed upon the following diet (rolled oats 40.0 per cent, casein 5.0 per cent, NaCl 1.0 per cent, $CaCO_3$ 1.5 per cent, and dextrin 52.5 per cent) they soon show signs of incipient xerophthalmia. As soon as the lids were badly swollen the different fats were added to the diet. We added liberal amounts of the fats to be tested, since we did not want to complicate our data by quantitative testing of fats at this time. It was found that cod-liver oil, butter fat, shark-liver oil, or burbot-liver oil, cured xerophthalmia when fed at two or three per cent of the diet for a few days. We did not find that any of the vegetable oils tested cured xerophthalmia after it had developed. It may be stated that in other experiments a few of these oils may have delayed the onset when fed in liberal amounts (8 to 20 per cent) from the beginning of the experiment. Let it be noted that coconut oil does not prevent or cure xerophthalmia even when fed at 15 per cent of the diet.

Hopkins was the first to point out that oxidation destroys fat-soluble A (13). He showed that if oxygen is allowed to pass through heated butter fat the fat-soluble vitamin is destroyed. With this treatment butter fat loses its power of inducing growth or of curing xerophthalmia due to lack of this factor.

Since we had not found butter fat very potent in the prevention of rickets under specific dietary conditions or in causing calcium deposition, we sought to treat cod-liver oil so as to destroy fat-soluble A. When a stream of air bubbles at the temperature of boiling water was passed through cod-liver oil for from 12 to 20 hours it no longer contained sufficient fat-soluble A when fed at 2 per cent of the diet to cure ophthalmia. The significance of these results in connection with the problem of a special calcium-depositing vitamin will be discussed later.

We had conducted many experiments which showed clearly that a diet may be so deficient in calcium as to prevent growth in young rats (14). Butter fat was not nearly so potent as cod-liver oil in promoting growth under these conditions. We selected a diet which was low in calcium and low in fat-soluble A, although the latter factor was not so deficient as to cause ophthalmia to develop. It contained about the optimal amount of phosphorus as far as we have determined it for the rat, and our problem was to see to what extent, if any, the different fats increased the efficiency of the animals in utilizing the small amount of calcium at their disposal. The diet selected had the following percentage composition: whole wheat 25.0; whole maize 19.5; polished rice 9.5; rolled oats 9.5; peas 9.5; navy beans 9.5; whole milk powder 5.0; casein 10.0; NaCl 1.0; dextrin 1.5. This food mixture was fed with each of the following fats: cod-liver oil 1 per cent, shark-liver oil 3 per cent,

coconut oil 10 per cent, cottonseed oil 10 per cent, olive oil 10 per cent, and butter fat 10 per cent. It was very apparent from our records that when cod-liver oil, shark-liver oil, or butter fat was fed, growth proceeded in a fairly satisfactory manner. Butter fat was not, however, the equivalent of the fish oils in this experiment. Coconut oil was the only vegetable oil which increased the efficiency of animals in utilizing their low calcium supply (15). It should be recalled that coconut oil did not prevent ophthalmia. These data show clearly a very remarkable property of certain fats which makes them of extraordinary importance in relation to calcium metabolism.

Although the data discussed above were very suggestive that there was another factor aside from fat-soluble A playing a rôle in calcium metabolism, it by no means proved it. We therefore supplemented the data obtained with these tests with observations on the effects of the several fats on the healing of rickets. For this purpose we used the technique which we have called the "line test." The diet used for this purpose consisted of wheat 33.0, maize 33.0, gelatin 15.0, wheat gluten 15.0, NaCl 1.0, and $CaCO_3$ 3.0. The proteins of this diet are of good quality and are abundant (about 33 per cent of the food mixture). The amount of phosphorus in the mixture is distinctly below the needs of the growing rat for this element. One hundred grams of this mixture contained about 0.3019 grams of phosphorus. Our observations indicate that the optimal amount of phosphorus in the diet of the growing rat is not less than 0.4146 per cent. It may be considerably higher. The calcium content of this food mixture is about 1.221 grams—approximately double that required for optimal growth and function. Although the diet contains an excessive amount of calcium no deposition of calcium salts takes place. The content of fat-soluble A is below the optimal, but suffices to prevent the development of xerophthalmia.

After animals have been fed on this diet for about 30 days one notices certain peculiarities in their movement. The gait is rather unsteady and the hind quarters waver from side to side. When they move off rapidly they hop, usually favoring one hind leg. When they exhibit these symptoms we have found it safe to rely on it that they will show the histological picture which is essential for the conduct of the test. When a group of rats are ready to be used for the test, some of them are given the substance which we desire to study in their food and the rest serve as control animals and continue to receive the diet unchanged.

When animals were suitably prepared for the "line test" different groups were fed the following list of oils: shark-liver oil, cod-liver oil, burbot-liver oil (a fish oil), butter fat, coconut oil, olive oil, maize oil, and sesame oil. The test animals and the controls were killed and autopsied at the designated time. It has been our custom to examine the distal end of the left femur and the proximal end of the left tibia for the reformation of the provisional zone of calcification.

The bones of animals on this diet are very short, and the ends much enlarged. On section the cartilage of the epiphysis is irregular in depth and the epiphysis is separated from the diaphysis by a zone of white tissue (the metaphysis) which may be about 0.5 cm. deep. In the bones of the control animals or the animals which give a negative "line test" there is no calcification of the epiphyseal cartilage and little if any in the metaphysis. The shaft is incompletely calcified. These bones have been completely described in another place (12). Rats which give a positive "line test" differ from the controls in having a broad, linear deposit of calcium salts on the metaphyseal side of the epiphyseal cartilage. The band, which may not be complete, is separated from the shaft of the bone by the depth of the metaphysis and from the nucleus seen on the freshly cut surface of an untreated bone as a yellow line which marks the epiphyseal border of the metaphysis. The deposit is blackened by silver nitrate in fresh or fixed gross specimens. It appears like a cross-section of a black honeycomb when it is examined with a binocular microscope. The deposit is in the proliferative zone of the cartilage. It may extend completely across the bone or may be interrupted or fragmentary according to the activity of the calcium-depositing substance. It is stained brown by silver nitrate and an intense blue by hematoxylin. It is separated from the calcified trabeculae of the shaft by the width of the metaphysis.

The several oils studied are listed in Table I. The amounts fed, the number of days administered, the length of the preliminary period, the number of animals tested, and the results of the test, are given. Since starvation causes the deposition of calcium salts in the bones under the conditions of this test, we always kept food consumption records in making all of these tests (12).

It will be seen from Table I that cod-liver oil, shark-liver oil, and burbot-liver oil, were highly effective in moderate doses in causing the deposition of calcium in the bones of rachitic animals. Butter fat was effective when fed in large amounts, but it was necessary to extend the time of administration to 14 days in order to obtain even a faint calcification on the bones. Coconut oil when fed at 20 per cent of the diet

for 15 days caused the deposition of a small amount of calcium salts in the bones. Maize oil, olive oil, cottonseed oil, and sesame oil, were likewise fed at 20 per cent for 14 to 15 days, but in no case was there any tendency to the deposition of calcium salts.

It will be seen from the table that samples of cod-liver oil which had been oxidized for four, twelve, and twenty hours respectively, were tested for their calcium-depositing power. The sample oxidized four hours still cured ophthalmia and also gave a positive line test. *However, those samples oxidized for twelve and twenty hours showed the potency in a degree apparently comparable with similar amounts of untreated samples, notwithstanding the fact that they had lost their power to cure xerophthalmia.* Oxidation, as pointed out by Hopkins (13), destroys fat-soluble A, but oxidation sufficient to destroy fat-soluble A did not destroy the other factor which plays an important rôle in bone growth. Coconut oil although lacking in fat-soluble A, since it will neither cure nor prevent ophthalmia, did cause a faint line of calcium deposition in the bones of the animals, thereby demonstrating that it contains at least small amounts of the calcium depositing vitamin.

TABLE I

KIND OF OIL	PER CENT	NUMBER OF DAYS IN PREPARATORY PERIOD	NUMBER OF DAYS FAT WAS GIVEN	NUMBER OF ANIMALS	RESULTS*
Cod-liver oil	2.0	28	11	3	Healing rickets
Cod-liver oil	0.2	70	5	1	Severe rickets, few fragments of calcium in the cartilage
Cod-liver oil	0.4	70	5	1	Severe rickets, no healing
Cod-liver oil	0.6	70	5	1	Beginning healing of rickets
Cod-liver oil (oxidized 4 hours)	2.0	25	6	3	Healing rickets
Cod-liver oil (oxidized 12 hours)	2.0	28	11	3	Healing rickets
Cod-liver oil (oxidized 20 hours)	2.0	29	10	3	Healing rickets
Butter fat	30.0	32	14	2	Beginning healing
Shark-liver oil	2.0	34	11	3	Marked healing
Burbot-liver oil	2.0	30	10	4	Healing well on
Coconut oil	20.0	24	15	5	Very slight evidences of healing
Maize oil	20.0	34	15	5	Severe rickets, no healing
Olive oil	20.0	34	15	5	Severe rickets, no healing
Cottonseed oil	20.0	29	15	5	Severe rickets, no healing
Sesame oil	20.0	24	15	5	Severe rickets, no healing

* For a detailed discussion of factors bearing on the conduct of this "line test" the reader is referred to Jour. Biol. Chem., 1922, liii, 313.

The evidence from this series of experiments demonstrates the existence of a vitamin which is apparently abundant in certain fish oils, notably cod-liver oil, and present to a lesser extent in butter fat and coconut oil among the foods examined. Butter fat is a much better source of the fat-soluble A than it is of the substance which regulates calcium metabolism. Our results are in harmony with those of Mellanby, in that they show that coconut oil has an antirachitic effect (7). One feels after studying Mellanby's data that he apparently did not appreciate the importance of the calcium and phosphorus in his experimental diets nor did he avail himself of the ophthalmia test in parallel with experimental rickets. Many of his apparently discordant results can probably be explained on the basis of these facts rather than in the content of his diets in the calcium depositing vitamin.

The question naturally arises as to what this new substance does in connection with bone growth. As has been pointed out, "the function of this organic factor appears to be to activate and coordinate cellular function. It appears to raise the efficiency of the organism and permits it to put into successful operation defense mechanisms which without it would have been ineffectual. It does not meet the defects in the inorganic composition of the diet directly by supplying to the body either calcium or phosphorus. It apparently meets them indirectly by so raising the potential of the cell as to secure the most efficient utilization possible of those substances available which are directly or indirectly concerned with ossification and calcification. It seems to bring about normal ossification and calcification or else the closest approximation to normal ossification and calcification compatible with the marked variations from the optimal in the amounts of certain of the inorganic constituents of the diet. It does not regulate the inorganic metabolism of the body but permits the body's own regulatory mechanisms to operate with increased efficiency and economy" (16).

The whole story of rickets cannot be told in this brief paper. The relation of sunlight and ultra violet light to the healing of rickets is a phenomenon which we do not understand. The work of foreign investigators, notably Raczynski, Sacks, Riedel, Putzig, and Huldschinski, as well as of Hess and Unger, Howland and Kramer, and ourselves in this country, show clearly that sunlight and ultra violet light exert a protective action in the prevention or healing of rickets. We know that when children with rickets are exposed to sunlight or to ultra violet light, and with no change in their diet, rickets tends to heal. We know that

when rats were fed a rachitic diet and exposed to the sunlight for four hours a day for 64 days rickets did not develop; rickets did develop in the control animals kept in the laboratory. We cannot logically conclude that sunlight, important as it is, can take the place of good nutrition. For a detailed account of the relation of sunlight, exercise, and hygienic conditions in relation to rickets the reader is referred to various papers in the bibliography (17).

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NATIVE DIETARY ON NIUÉ ISLAND

ANNIE B. JUNIPER

Those engaged in home economics may be interested in hearing of foods and culinary processes on a primitive isle.

Away off the tourist tract in the South Pacific, 380 miles south of Samoa, and some 250 miles east of the Tongan group, lies a small island called Niué, 40 miles in circumference. In days gone by it was not safe for a white man to land there. Captain Cook attempted it, but received such a hostile reception from this independent people that he quickly left and named it Savage Island. Today there are about 4000 natives, and thirty white folk.

There is very little communication with the outside world. An erratic bi-monthly cargo service from New Zealand, a sailing craft of a hundred tons, brings food and other stores over the intervening 1700 miles. During the seven months I spent there, no passenger boat called, nor is a boat usually seen during the hurricane season, December to April.

The natives of this island are still unspoilt by tourists. They are all dark-skinned; some with straight, others with curly black hair. They are of average height, well proportioned, slight and muscular rather than fat. Many remind one of gypsies seen in England. They are not overburdened with nerves; children and adults bear pain stoically. As a whole they are not very thoughtful for their children or old folk; indeed they are themselves but children in many ways.

As regards natural products, there are no cattle on the island, therefore no fresh beef or milk. Fowls abound, but are of a poor strain. They run wild, and eggs are very difficult to obtain as the hens lay them in the bush and raise continuous families of chicks. Pigs, wild and tame, are found. Both kinds hunt their food, though the latter are fed some coconut and bananas. They are small animals, and the pork is sweet. They are usually killed for some function, such as a feast.

As there is no stream, river, or lake on Niué, only sea fish are available. The coast is of treacherous coral, against which the Pacific rollers thunder continuously, and all fishing is done by natives from homemade canoes with out-riggers. There are flying fish, gorgeous colored blue, pink, and red fish of different kinds which the natives like. There are also small land crabs and *uga* (pronounced "unga"), which are good.

The island consists of ravines, pinnacles and boulders of coral, sharp and cutting, with but few inches of soil, at most from one to two feet.

The coconut palm and bananas, over a dozen varieties, flourish in abundance the year round; and in lesser numbers and at particular seasons, the mango, breadfruit, limes, oranges, lemons, guava, passion fruit, grenadilla, pineapple, paw-paw, custard apple, and small Italian tomatoes and cucumbers yield food. There are no vegetable gardens as we know them, and vegetables are scarce. The *taro* is the most largely grown, and forms the staple diet of the native. The *yam* or *ufi* comes next, and an occasional cabbage, a few beans or an egg plant are sometimes obtainable. There are no greens and salad plants, except small onions. All root vegetables and many fruits are exceedingly fibrous, and are rich in lime and starch.

The dietary habits are simple. As a rule but one meal, or at most two, are taken daily, but fruit of various kinds, sugar cane, and cocoanut are eaten all day long, by both children and adults, whenever they can be procured. The morning meal often consists of cooked taro and a drink of water or coconut milk. The evening meal usually consists of taro, with a minimum of fish, land crab, or perhaps tinned meat, cooked unripe bananas, with water or coconut milk as a beverage. A young coconut such as is used for drinking, contains nearly a quart of milk, which, at just the right stage, is almost effervescent. It is a delicious and satisfying beverage. Instead of the hard meat of the mature nut, the shell is lined with a thin layer of soft gelatinous substance which the native scoops out to eat.

The food of pregnant mothers and young babies is carefully watched. The mothers eat no meat or red fish during pregnancy. Most babies are breast fed for nine months, though prepared milks are now used to some extent. At ten months infants are given a certain kind of cooked banana and taro. The food is chewed by a young healthy girl, and fed to the child. Later the child is given a tiny piece of fish or fowl, but all children, young or old, are given fish, fowl, or meat, in very small portions.

Niué cooking processes are limited. Saturday afternoon is the great cooking day on which the family oven or *umu* is used. Sticks and dry oily parts of the coconut tree are placed on the coral ground and lighted; fresh coral is piled on the top and heated to a great heat. Some of the hot coral is then removed; the prepared food is placed on the hot coral stones and more heated coral is placed over the food. Leaves are spread over these and lastly a sack is placed on the leaves to keep the heat in. Thus is the food half baked and half steamed for from two to three hours,

when it is ready to eat. What is not immediately required is re-covered and left cooking over night. The oven is in the cook-house, which has a palm-leaf roof, and a coral floor, but no sides. The utensils are huge bush knives, a big wooden trough (*kumete*), a strainer of *laukala* which is a brown material found at the base of the coconut leaf, a native grater which is a piece of an iron hoop set in a piece of wood, the iron edge being jagged into teeth, a pail, and various piles of leaves which serve as saucepans and baking tins. Sea-water is used instead of salt. In making coconut cream, used in their cookery instead of water, five or six old coconuts are grated into a strainer cloth, coconut water and sea water are added, the strainer is tightly wrung, and a white cream flows out. With this the following dishes are prepared:

Kaofi, a mixture of the root of a plant they call maniota and coconut cream, rolled in banana leaf and cooked in the native oven.

Faikai ika, fresh fish, cleaned, covered with cream, rolled in a leaf, and cooked in the oven. A chicken is similarly prepared.

Luu, young taro leaves placed in a banana leaf, coconut cream added, and the parcel wrapped in lautea leaves for protection during cooking.

Faikai loku, sliced paw-paw, mixed with coconut cream and arrow-root, rolled and tied in leaves for baking.

Vaihalo, arrowroot mixed with scraped young glutinous coconut and the milk from the nut, boiled in a saucepan, or cooked by inserting a white-hot stone in the vessel. This is a pleasant-tasting sweet porridge and is served hot, in half coconut shells.

Taro are pared and baked in the oven; bananas are preferred green, baked in their skins. Eggs are not eaten by the natives. Chickens, though an important feature of all feasts are rarely eaten at other times.

To sum up, the dietary is starchy and bulky, low in protein, high in fat from the coconut. The people look well-nourished, but not over-fed, and are noted for being the best workers among the Pacific natives. Venereal and skin diseases, first introduced by whites, are prevalent but, apart from these, the natives are a healthy people.

A UNIFIED PROGRAM OF EXTENSION WORK FOR THE FARM HOME[1]

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The west is setting the pace for the nation in growth and development. The increase in the number of farms in the ten western states, according to the last census, was from 10 to 119 per cent, while for the whole United States it was only 1.5 per cent. The west is predominately rural. Land is the great asset and the instinct of the westerner is to make his living from the land; therefore, the land grant colleges and the United States Department of Agriculture play an important part in development and progress.

The unified extension program for the farm home must take care of all interests of the farm home, i. e., the home economics interests and the agricultural interests of the farmstead which usually come under the direct management of the women and girls.

Last year in the fifteen southern states, 308,000 of the 517,000 women and girls, who conducted their demonstration under the guidance of home demonstration agents, reported that the farm home productive activities such as gardening, preservation of fruits, vegetables, and meats, poultry work, home dairy work, growing of flowers for sale, saving on clothing work and the fireside industries, had a valuation of $18,316,880. Twelve millions of this went for necessities in the home while six millions went for comforts, pleasures, education of boys and girls, investments, and bank accounts. The amount produced by that number of farm women and girls in only one section of the country was as much as all agricultural and home economics extension throughout the United States costs from all financial sources. No one can question extension work as a good investment for the country.

Intellectual and physical efficiency is based primarily upon a well nourished body. The farm woman is learning through home demonstration work to provide proper and adequate diets for her family. She is being helped to a full realization that her first responsibility above

[1] Abstract of an address presented at the Fifteenth Annual Meeting of the American Home Economics Association, Corvallis, Ore., August, 1922.

everything else is to give her child a fair chance to live, to grow, and to develop into a normal healthy human being. This woman is also learning to conserve her own time and vitality.

Clothing has been a popular project in the extension program and it plays an important part because it has been made practical and economical. However, if a county has nothing to report in its home demonstration work but dress forms and hats, it cannot hope to make a deep impression on the public mind.

The taste that most women and girls have for the aesthetic is being developed by helping them to make the home itself attractive as well as comfortable. The unified program provides also for the beautification of the entire farmstead.

Community movements and activities have been stimulated, and the program should represent the needs of the prevailing home in the county or community.

All extension workers, both men and women, must play a part in the execution of the program. No other country has recognized women's ability and responsibility to quite the same extent as it has been recognized in the extension service in this country. The extension service is dependent upon the research work in agriculture and home economics in colleges and universities, and stands back of any movement which promotes it.

The home economics extension workers are proud of their section in the American Home Economics Association. The support and inspiration we get from the Association will lead us on to greater service.

A NUTRITION DEMONSTRATION

JUANITA E. DARRAH

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One of the chief causes of deficiency in the dietary of certain sections is the rather limited quantity of milk consumed. This applies more especially to certain rural communities but is not peculiar to Florida alone. It is probable that the southeastern states have a similar diet. In order to help the extension worker demonstrate the value of adding milk to the limited diet common in Florida, some experiments were

conducted with albino rats. A basal ration was fed consisting of rice, grits, salt pork, sweet potatoes, cane syrup, and a very small amount of collards. One group of animals was fed this monotonous diet without milk. To one group was given, in addition, whole milk powder equivalent to one glass of milk per day calculated on the basis of the calories provided by milk, when one glass of milk per day is taken by the average child of five years; to a third group was given a ration supplemented by whole milk powder equivalent to one quart of milk in the dietary of a child of five.

It was estimated that, after drying, one gram of sweet potatoes yields 3.7 calories, and one gram of milk powder gives 5 calories. The ration containing milk in proportion equivalent to a quart a day was formulated as follows:

Ration containing equivalent of one quart of milk

	per cent
Whole milk powder	33.33
Hominy grits	40.00
Polished rice	6.66
Sweet potatoes (dried)	6.66
Salt pork	6.66
Cane syrup	3.33
Collards	3.33

Ration containing equivalent of one glass of milk

	per cent
Whole milk powder	8.0
Hominy grits	52.0
Polished rice	10.0
Sweet potatoes (dried)	10.0
Salt pork	10.0
Cane syrup	5.0
Collards	5.0

A great difference was observed in rate of growth, adult size, appearance, and behavior of the rats on these different rations. The group receiving milk equivalent to one glass per day were intermediate in size between the other two groups. Behavior was normal. Those rats which got no milk were stunted, rough coated, and of vicious and nervous disposition. They showed a tendency to have scaly, bloody ears and tail. For example: at the end of a similar period of time, a rat on diet (1) gained 14.5 grams; a rat on diet (2) gained 93 grams; a rat on diet (3) gained 225 grams. The live animals were sent to the county and state fairs for exhibition in the nutrition booths. Considerable interest was thus aroused in the topic of milk consumption. They were also

used to illustrate lectures to groups of school children from kindergarten to high school and appeared before women's clubs and parent-teacher's associations. The United States Bureau of Animal Industry became interested. They offered to prepare two sets of rats as permanent exhibits. One set of stuffed rats was kept in Washington and one was returned to Florida. The workers in Florida may now use either the live rats or the stuffed ones for demonstration purposes. The stuffed rats have been on exhibition during several weeks of milk campaigns, in different parts of the state. A large increase in milk consumption is being observed. It is easy to impress the fact that not only must some milk be taken, but also that the supply must not be stinted. Litters of young have been successfully reared by the rats receiving milk.

It was thought advisable to attempt an analysis of the supplementary value of the milk powder. A new series of experiments was begun to note the effect of milk constituents when added to the milk free ration, separately. In one, 10 per cent casein alone, in another 10 per cent casein and 5 per cent McCollum's salt mixture no. 185, and in a third butterfat in addition to casein and salts have been incorporated. After five months the rate of growth observed with addition of casein alone is much better than that obtained on the same ration without such addition. The ration containing both casein and salts addenda is most beneficial of all. There seems to be no additional acceleration of growth produced by addition of five per cent butterfat to this ration. This may be explained on the ground that yellow corn meal was used in this set of rations. Collards were omitted. Addition of casein and salts gives as good a rate of growth as addition of milk powder. For example: at the end of a similar period of time, a rat on the milk free ration plus the casein gained 43 grams; a rat on the milk free ration plus the salt mixture gained 270 grams; a rat on the milk free ration plus the butter fat gained 206 grams. These experiments seem to indicate that it is the quality of protein and the inadequate supply of inorganic salts which account for deficiencies in the southern dietary.

The experiment has been repeated several times, and there will be no difficulty in repeating it in other laboratories.

STUDIES ON CALCIUM AND MAGNESIUM METABOLISM IN NORMAL WOMEN[1]

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The subjects of these experiments were twelve normal young women. During a sixteen day period, their food intake was definitely controlled and quantitative collections of urine and feces were made. Both the food and excreta were analyzed for calcium, and their magnesium content also determined in one group. In this way, calcium and magnesium intake, excretion, and balances were determined. The subjects were divided into three groups of four each and the experimental period consisted, in each case, of four four-day periods. The object of the experiment with the first group was to ascertain whether an increased intake of calcium would affect the urinary and fecal excretion of magnesium and vice versa, thus showing interrelations between the metabolism of these two elements. In the case of the second group, the experiment was undertaken to investigate the effects of acid-forming and base-forming diets upon calcium excretion, while, with the third group, the diets were arranged with the hope of bringing to light the relation, if any existed, between the vitamine content of the diet and calcium assimilation. The diets were planned so as to provide adequate and constant amounts of energy, protein, fat, and ash constitutents throughout the experiment. Only distilled water was used for drinking or cooking purposes. Tea and coffee were allowed in moderate amounts. The chief articles of the diets were white bread, purified butter or nut margarine fat, very lean, minced beef, potatoes, rice, peanut butter, apples, sugar, and milk (Merrell-Soule dried milk diluted to constant composition with distilled water). The basal rations of the third group, selected so as to be as low in vitamine as possible, consisted only of very lean beef, rice, white bread, sugar, cornstarch, purified fat from nut margarine, and skimmed milk powder. The vitamine content of the diluted milk powder was probably still further reduced by cooking with rice in a pressure cooker (25 minutes at 10–15 pounds pressure). The following table shows roughly the dietary procedure used with the three groups.

[1] Abstract of a report presented at the Fifteenth Annual Meeting of the American Home Economics Association, Corvallis, Ore., August, 1922.

	GROUP I	GROUP II	GROUP III
Period I	Basal diet low in calcium and magnesium	Balanced diet, approximately equal amounts of acid and base-forming elements	Basal diet practically free from vitamines
Period II	Basal diet plus 6 gm. magnesium citrate per day	Basic diet, consisting almost entirely of base-forming foods	Basal diet plus 6 cakes compressed yeast per day
Period III	Basal diet as in Period I	Balanced diet as in Period I	Basal diet as in Period I
Period IV	Basal diet plus 6 gm. calcium lactate per day	Acid diet—consisting almost entirely of acid-forming foods	Basal diet with butter fat substituted for nut margarine fat

The conclusions reached from the data collected in these experiments are, in brief, as follows:

Group I. Interrelations between calcium intake and magnesium output and between magnesium intake and calcium output have been definitely established. An increase in the intake of calcium, by the ingestion of calcium lactate, caused increased magnesium output, while the ingestion of magnesium citrate resulted in an increased calcium excretion.

Group II. The base-forming diets tend to divert calcium from the urine to the feces, while the acid-forming diets increase urinary calcium at the expense of fecal calcium. While the results are not conclusive they indicate a tendency toward decreased elimination of calcium with lowered negative balance on base-forming diets, and increased calcium excretion with augmented negative calcium balances on acid-forming diets.

Group III. The addition of yeast to a basal diet, practically free from vitamines, led to lowered excretion of calcium and exerted a very favorable influence upon the calcium balances, usually changing negative balances to positive or to equilibrium. The substitution of purified butter fat for an equal weight of purified fat from nut margarine also resulted in decreased calcium elimination. The urinary calcium was usually unaffected but the amount of calcium in the feces was lowered. These facts suggest some influence of the vitamin content of the diet upon calcium assimilation.

REPORT OF WORK ON ENERGY EXPENDITURE FOR SEWING AND SOME OTHER HOUSEHOLD TASKS[1]

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Office of Home Economics, U. S. Department of Agriculture

The year's work was a repetition of last year's work on sewing, with a woman as subject, in order to check the results after a lapse of a year; and an extension of the work subsequently to check that on washing dishes, ironing, and sweeping, done previously by another subject.

The young woman who served as subject is 5 feet 6 inches tall. Her average weight is now 134 pounds, which is five pounds less than last year. During the experimental period she always ate the same kind of breakfast so as to secure uniformity in the energy expended for the digestive processes.

The breakfast consisted of: ½ grapefruit with 1 teaspoon sugar, 6 tablespoons toasted corn flakes with 2 teaspoons sugar and ½ gill cream, 1 slice of buttered toast, 1 glass milk.

A routine for the day was followed consistently. The subject ate her breakfast at approximately 8:00 o'clock in the morning and entered the calorimeter about three-quarters of an hour before the experimental period and record keeping began at 11:30 a.m. The experiment continued for two hours, during which time a carefully prescribed routine was followed. The carbon dioxide and water-vapor output were calculated from the weight of the absorbers in which they were collected. The heat records from which the energy output was computed were chiefly made by automatic devices of great accuracy.

The energy eliminated when the subject is at rest must be known in order to determine the amount of energy used in performing a certain task, the difference in energy output between the rest and work periods giving the energy involved in the performance of the work.

During the sewing experiments the subject was seated in a bentwood, cane-seated chair and remained as quiet as possible, avoiding any movement not connected with the work. The hand sewing was done on sheets at speeds of 18 and 30 stitches per minute which made it possible to determine the relation between the rate of work and the energy

[1] No account of these investigations would be complete without mention of the work of Mr. H. G. Barrot, in charge of the Respiration Calorimeter Laboratory and his associates, Mr. W. B. Emerson, Mr. S. C. Clark, Mr. M. H. Sherrill, and Miss Miller, on whom fell all the responsibility for securing the accuracy of the apparatus, supervising the routine of each test, and calculating the results.

expended. Sewing on sheets at 18 stitches per minute also served as a basis for comparison with sewing on other material such as a woolen army blanket. Earlier work on machine sewing, with both foot and motor driven machines was also repeated. The results agree very closely with those previously obtained except in the case of sewing with the foot-driven machine; there the value was much lower, because of the removal of a braking effect on the belt where it ran through the table top and rubbed heavily on the edge of the holes; this change reduced by about 50 per cent the amount of energy necessary to operate the machine.

For the sake of uniformity only one kind of stitch was used in hand sewing. This was the ordinary hemming stitch, the thread being pulled completely through with each stitch. The hem had been turned in advance, and threads of uniform length (37 inches) were provided. The movement of the arm gradually lessened as the thread grew shorter, but the rhythm was always the same and all work was timed to the beat of a metronome.

The energy required for sewing on the soft wool blanket was less by approximately 25 per cent than on the sheet, although the blanket was much heavier. The lower figure we attribute to the more open texture of the material and greater ease in putting the needle through.

In dishwashing experiments a table of adjustable height was used, and the comparative amounts of energy expended when working on surfaces of four different heights were determined. In one set of experiments the table was too low for comfort; in two, it was too high; and in one, it was set at the height which seemed the most comfortable to the worker.

The dishes, consisting of two plates, two teacups, two saucers, and two bowls were taken from one pan, in succession, given ten rubs, turned; given ten more rubs on the other side, and placed in another pan. All the work was done to the beat of a metronome, beating 130 times per minute, 1 beat being allowed for each rub and 10 beats to change pieces.

When the table was set at the lowest point tested, the distance from the top of the pan to the floor was 75 cm. This was so low that it necessitated bending the body at the hips and consequently supporting the whole upper body in this "off balance" position, and increased the energy output about 25 per cent over that found when the table was at a comfortable height. Very little difference between the energy expenditure

was noted in the experiments where the table was too high, and in those where the table was at a comfortable height. This is thought to be principally because the worker was able partially to support her arms on the edge of the pan. If the arms had been held free, the amount of energy expended to support them would probably have increased the total by several per cent, as was the case in the previous similar experiments.

The task of sweeping was done on the bare floor of the calorimeter as in earlier experiments. The broom was moved at the rate of 38 strokes per minute; the effective portion of the stroke was the forward movement and the broom was lifted from the floor during the return.

The ironing was done with towels 16 inches square and a 5-pound iron, and the board was placed at the same height as in the previous work with another subject. The rate of work was 70 strokes of the arm in 50 seconds with 10 seconds to change towels.

The following tables give a summary of experiments carried on in 1921–22.

Energy expended in carrying on household tasks by Subject E. M. 1921–1922

KIND OF WORK	NUMBER OF EXPERIMENTS PERFORMED	AVERAGE AMOUNT OF TOTAL ENERGY EXPENDED PER HOUR	AVERAGE AMOUNT OF ENERGY EXPENDED FOR WORK ALONE	DATE OF EXPERIMENTS
		calories	*calories*	
Rest	13	66.7		Dec., 1921–Mar. 10, 1922
Rest	14	61.2		Mar. 10,–May 1, 1922
Rest	6	64.0		May, 1922
Machine sewing:				
Foot-operated machine	8	87.6	20.9	Dec., 1921–Jan., 1922
Motor-operated machine	10	75.6	8.9	Dec., 1921–Jan., 1922
Hand sewing:				
Sheets, 18 stitches per min.	5	72.3	5.6	Jan.–Feb., 1922
Sheets, 30 stitches per min.	6	76.1	9.4	Jan.–Feb., 1922
Blanket, 18 stitches per min.	11	71.0	4.3	Feb.–Mar., 1922
Dishwashing:				
Top of pan from floor, 75 cm.	3	93.5	32.3	Apr., 1922
Top of pan from floor, 92 cm.	6	86.1	24.9	Mar., 1922
Top of pan from floor, 107 cm.	3	83.8	22.6	Apr., 1922
Top of pan from floor, 117 cm.	5	84.1	22.9	Apr., 1922
Ironing	5	88.0	24.0	May, 1922
Sweeping	7	105.0	41.0	May–June, 1922

Since the routine followed with the subject E. M. in 1921–22 was as far as possible the same as in similar experiments made with the same subject in 1920–21, and with the subject L. B. in 1919–20, the results for the three years are comparable. Table 2 summarizes the average hourly energy expenditures for different tasks as determined during the three years' work.

Comparison of energy expended in carrying on household tasks by different subjects and at different periods

KIND OF WORK	ENERGY EXPENDED PER HOUR FOR WORK ALONE		
	Subject F. B. 1920	Subject E. M. 1921	Subject E. M. 1922
	calories	*calories*	*calories*
Knitting	10.1		
Crocheting	8.3		
Darning	8.0		
Hand sewing, 18 stitches per min.			
Handkerchiefs		5.8	
Duck, 8 oz.		5.6	
Sheeting		5.6	5.6
Blanket, army		4.3	4.3
Hand sewing, 30 stitches per min.:			
Sheeting	10.0		9.4
Blanket		7.2	
Machine sewing:			
Motor-driven machine		8.3	8.9
Foot-driven machine		33.6	20.9
Dressing infant	23.6		
Washing towels	49.6		
Ironing towels	24.3		24.6
Sweeping floor	40.1		
Washing dishes:			
Top of pan from floor, 75 cm.			32.3
Top of pan from floor, 78 cm.	30.0		
Top of pan from floor, 92 cm.			24.9
Top of pan from floor, 98 cm.	20.3		
Top of pan from floor, 107 cm.			22.6
Top of pan from floor, 113 cm.	24.4		
Top of pan from floor, 117 cm.			22.9

SUMMARY

From the data reported, it appears that knitting, crocheting, darning, and hand sewing make moderate demands on the body as regards energy expended per hour compared with washing, ironing, sweeping, and dishwashing. The differences observed in energy expended on sewing light-weight and heavier cloth are small, and are not sufficient for

general deductions. These tests do not take into account such matters as fatigue from sitting in one position, from monotony of work, etc., but simply the energy expended per hour for the work done. Sewing on a machine driven by foot power makes much more demand on energy expended per hour than sewing either by hand or by a motor-driven machine, but it entails a much lower expenditure of energy per yard of sewing than hand sewing. Sewing with a motor-driven machine makes slightly less demand on body energy per hour than sewing by hand and much less than sewing by foot-driven machine; the energy expended per yard of sewing is also proportionately smaller.

Of the other tasks studied, washing and sweeping make the largest demand per hour, and dressing an infant (a life-sized model) about seven times as much per hour as hand sewing. Dishwashing, at a table of such a height that it "fits" the worker, makes a demand on the body of about 21 calories per hour as compared with about 30 calories with a working surface too low for the worker, and about 24 calories per hour with too high a working surface.

AN ANALYSIS OF TEXTBOOKS IN CLOTHING AND TEXTILES

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(*Concluded*)

DISTRIBUTION OF SPACE AMONG THE FOURTEEN MAJOR TOPICS

In order to portray more clearly the persistence and recurrence of fundamental subject matter in clothing and textiles as shown in the 43 texts analyzed, a study of percentages devoted to each of the fourteen major topics was made. Even a superficial examination indicated that these books have been characterized by considerable diversity in the number and combination of topics, a characteristic not unnatural in a field which is relatively young and rapidly developing.

The most useful and efficient material to be included in any school subject must of necessity be determined (1) by the ends to be accomplished through the subject in question, and (2) by a careful study of the needs of society, a test which Woody[11] has applied to spelling texts. A

[11] Woody, C., Jour. of Educ. Research, I.: 119, Feb. 1915.

description (unpublished—Division of Home Economics, University of Minnesota) states that home economics as a college curriculum in a university should include: (1) preparation for homemaking; (2) preparation for home economics teaching and extension teaching in home economics; (3) preparation for vocations outside the home into which women enter and for which a major in home economics is desirable, such as dietetics or institutional management. This description, applied in whole or in part, would hold true for other types of schools in which home economics is taught and for which textbooks are needed.

The topics which should be included in textbooks for accomplishing these ends can be determined only after a careful analysis of all of the operations of homemaking, institutional management, and other occupations for which home economics curricula prepare. From this point of view the variability of topics previously referred to may be expected, and may in part constitute an effort to find the most socially useful material. There is sufficient evidence of a fairly well-defined core of subject matter which has been developed. Furthermore, other factors have contributed to the variations observed in the distribution of subject matter.

The authors' conception of the function and place of textiles and clothing in relation to the whole field of home economics has often been quite dissimilar. The content of home economics itself has been passing through a period of evolution which would explain many of the modifications of textiles and clothing subject matter. Finally, the authors have planned for diversified groups of students.

Increases or decreases in the amount of emphasis placed upon the several topics during this period, are shown in nearly all of the percentage distributions of the major topics during the semidecades tabulated (see Table I). These variations are not constant for all of the topics, and have been influenced to some extent by changes in social and economic conditions.

There has been a very slight tendency to decrease the attention given to *general instruction and supplies*, it having occupied a smaller percentage of space since 1910 than before that date. Such formal exercises as the teaching of correct methods of placing a thimble on the finger, and of threading a needle with a given number of movements are less frequently found or more likely to be covered by a single sentence in the more recent texts.

Patterns, drafting, and draping as a topic has fluctuated greatly, so far as relative emphasis is concerned. The highest peak was reached in 1900 to 1904, when 23 per cent of the space in the four books published was devoted to this subject. The lowest point occurs in the two books published since 1919, in which an average of less than 2 per cent was given over to this material.

TABLE I

Average Percentage Distribution by Semi-Decades, of Subject Matter in Texts Analyzed

TOPICS	1880–1884	1885–1889	1890–1894	1895–1899	1900–1904	1905–1909	1910–1914	1915–1919	1920
General instruction and supplies	10.84		9.71	5.72	9.04	8.56	5.77	4.54	5.22
Patterns, drafting and draping	12.17		9.13	11.69	23.01	3.70	8.96	9.16	1.70
Applied design				3.18	1.14	1.52	1.14	3.58	2.87
Sewing processes	4.43		34.02	22.57	40.70	41.42	24.50	18.64	14.37
Garment construction	51.10		29.98	26.85	7.06	16.35	21.51	28.18	16.70
Care of clothing	9.07		7.42	8.31	14.72	9.31	9.65	3.87	8.82
Millinery	7.97							0.85	
Knitting, crocheting, and lace making						4.46	0.45	0.48	
Textiles manufacture			0.60	3.43		5.32	6.28	4.60	4.94
Textile fibers			0.86	8.69	3.16	4.00	11.94	14.68	19.47
Fabrics and their uses	4.43		7.34	8.04	2.47	3.37	7.80	8.80	21.43
Glossary				0.22			0.06	0.57	
Bibliography						0.43	0.52	0.29	
Index			0.60	1.31	0.98	1.58	1.42	1.81	3.53

Applied design has occupied a small space throughout all the decades studied. The most significant change occurred about 1915, the percentage space changing from 1.1 per cent for the 13 books published in the five years preceding that date, to 3.6 per cent for the 14 books put out in the five years following it. A textbook study probably pictures this phase of clothing work more inaccurately than any of the topics under discussion, as nearly 50 per cent fail to include art applications. In view of the fact that four-fifths of the cases where applied design was not included occurred previous to 1915, it would seem that the topic has secured comparatively recently a place in the subject matter of clothing and textiles.

The emphasis placed upon *sewing processes* has grown and then declined. The high level, approximately 40 per cent, occurred between 1900 and 1919. Since 1909 a change in the popular conception of the nature of work in clothing has resulted in the decreased emphasis placed upon sewing processes, to which certain economic and psychological considerations have probably contributed. The use of samplers which was responsible for the large percentage of space devoted to sewing processes during certain of the periods studied has been noted previously.

Garment construction and sewing processes are necessarily closely associated, the one embodying the practical application of the other. It is to be expected, therefore, that the emphasis placed upon garment construction would show a considerable decline until 1905; since then it has been gradually increasing. The average yearly percentages, when plotted, show this clearly, as the peak in the curve representing the relative amount of space devoted to sewing processes corresponds in date to the low point in the garment construction curve, and as the one descends the other ascends. For this and the preceding comparison the five textiles texts were omitted.

Care of clothing reached its highest peak in the 1900–1904 period; since then it has gradually declined. The earlier books devoted much more space to the discussions of darning and patching than did the later texts. Since 1917, however, a tendency to increased emphasis has appeared. The latter change is likely attributable to a response on the part of the textbook writers to the general thrift movement which started during the war.

Millinery has been given little attention, three authors only having included it, and from three to eight per cent being the range of space allotted the subject.

Hand knitting, crocheting, and lace making also has not generally been considered a part of this subject matter field. Only five authors have included any portion of this topic, although 16 per cent of the contents of one book were devoted to it.

Textiles has received more and more emphasis during the periods studied. In *textile manufacture* a slight lessening of emphasis has obtained since 1915. The extremes of emphasis placed upon this topic would doubtless well illustrate the effect of the previously mentioned differences in fundamental interests and experiences of the various authors.

The gradual increase in the degree of emphasis placed upon the consideration of *textile fibers* is also clearly shown and is closely related to both textile manufacture and to the study of fabrics and their uses.

Fabric study is the connecting link between textiles and clothing. The products of textile manufacture are the materials of clothing construction. Since 1905 fabric study has been receiving a growing amount of attention, which has been especially marked since 1917. This topic, in particular, shows the response made by textbooks to one of the more recently recognized fields in economics, the economics of consumption, and also shows a recognition of the highly important part played by women in that field. In fact, textiles as a whole may be said to be very largely preparation for more efficient consumption, a type of training which has not been ignored in clothing work.

DISTRIBUTION OF SPACE AMONG FIVE SELECTED SUBTOPICS

Clothing and textiles is a comprehensive term. The field includes a large volume of subject matter, and any classification, like that used in the present study, which condenses such a multidude of detail within the confines of fourteen topics, obscures thereby certain evidences of evolution. On the other hand, it would obviously be impossible, within the limits of the present paper, to trace the progress of each of the 54 subtopics, or of their minor subdivisions. Five subtopics have been chosen to illustrate the character of changes which have occurred during the past four decades, so far as textbooks have reflected such modifications, these having been selected because of certain economic and social considerations (see Table II.)

TABLE II

Average Percentage Distribution, by Semi-Decades, of Five Selected Subtopics in Texts Analyzed

SUBTOPICS	1880–1884	1885–1889	1890–1894	1895–1899	1900–1904	1905–1909	1910–1914	1915–1919	1920
Sewing machine and its uses*			0.46		0.08	0.44	0.59	0.70	2.33
Drafting and pattern making*	10.65		8.83	11.69	22.74	3.21	8.55	6.00	
Commercial patterns and their use*	0.20		0.26			0.32	1.78	2.96	1.70
Remodeling					0.04		0.37	0.15	0.63
Economics of clothing and buying	4.10		2.00		0.11		1.79	1.89	5.30

* Three books in 1910–1914 and two in 1915–1919 omitted in averaging for this subtopic because essentially devoted to textiles.

The *sewing machine and its use* have not been included in all clothing texts, but the number in which it has been discussed has increased noticeably since 1894, when the subject was first mentioned. It is not included in the five textiles textbooks which have been omitted for this particular discussion. Of the 38 clothing books, 14 give some space to the sewing machine. Ten years elapsed between the first reference in 1894 and the second mention of the subject in 1904. Material on this subject was found in three other books published previous to 1915. Since then 9 of 16 books have included it.

The proportional amount of space devoted to the study of the sewing machine has increased considerably since 1905. The actual amount of material on the subject has not been large at any time, and very few illustrations have been used despite the complicated nature of the mechanism discussed. Three books published between 1905 and 1914 had approximately one half of one per cent devoted to the sewing machine, nearly all of which was text, 3 illustrations having been used in one book. Clothing texts published in the five years following contained a greater amount of such material, with a more liberal use of illustrations. Although there was less than one illustration per book during this period, they occupied about one-sixth of the total space devoted to the subject. The two most recently published of these clothing texts have both treated the subject at much greater length than did their predecessors, the total amount averaging 2.4 per cent. There has been no freer use of illustrations than during the earlier period, their proportion being less than 0.2 per cent. The sewing machine is one of the most important home labor-saving devices and is much more commonly owned today than it was even twenty years ago. Its wider use would seem to justify a greater increase in emphasis.

The statement is frequently made that *drafting and pattern making* has been receiving less emphasis since commercial patterns have become so plentiful. The prominence of drafting in clothing texts would indicate that the above statement should be qualified. The average amount of space given to drafting, which has appeared in 20 of the 38 clothing books, has changed from 9 to 12 to 23 per cent, respectively, during the three semi-decades after 1890. The next five-year period saw the amount decreased to 3 per cent, but it increased to 8.5 per cent and then fell to 6 per cent in the two following semi-decades. Of the books published between 1915 and 1919 a larger proportion contain drafting than do those of either the two preceding periods. The two most recent books contain no reference to drafting. Illustrations have been quite freely used, often occupying nearly as much space as the text, which is partly due to the large-sized illustrations required. These textbooks present evidence that drafting must still be considered practicable by a considerable number of persons. (See Table III.)

A very different picture is presented in the material concerning *commercial patterns and their use*. The subject has had a more recent origin than did drafting, having been only briefly mentioned in the two books published previous to 1908. Since that date there has been a consistent growth in the attention paid to the use of such patterns. Each successive decade has shown an increase in the number of books, and in the percentage of books published, which include it, and also an increase in the total space devoted to the subject. Generous use has been made of illustrations, which average 5 per book, for the decade preceding 1920. Table IV shows this increase in the space devoted to commercial patterns and the part occupied by illustrations. This growth has followed a rapid development in the manufacture and use of commercial patterns.

Remodeling has not been included widely in clothing and textiles work as outlined by textbooks. The subject is found in 7 of these 43 texts, but in only one did the amount exceed 1.3 per cent of the total, and 3 had less than 0.5 per cent. The allowance of space in the last two books of those studied was 0.6 per cent, the highest average for any of the semi-decade periods. One illustration was found in the book published in 1920. In the

light of common practice this subject might seem to have been slighted in these textbooks, but certain factors may have contributed to the limited space allotted. Careful and wise selection of clothes means a reduction in time spent on "making over" garments, an increased use of ready-to-wear garments has had a similar effect, and finally, the sewing processes used in garment reconstruction duplicate those employed in their construction.

TABLE III

Distribution by Semi-Decades of Subject Matter Concerning Drafting and Pattern Making in the Clothing and Textiles Texts Analyzed

PERIOD	NUMBER OF BOOKS	PER CENT OF ALL CLO. BOOKS	AVERAGE TOTAL PER CENT	AVERAGE PER CENT TEXT	AVERAGE PER CENT ILLUS.	AVERAGE NUMBER ILLUS.
1880–1884	1	100	10.65	6.63	4.02	11.0
1885–1889						
1890–1894	1	50	8.83	7.05	1.78	5.0
1895–1899	2	66	11.69	8.26	3.42	10.6
1900–1904	3	75	22.74	17.58	5.15	10.2
1905–1909	2	50	3.21	1.62	1.59	8.0
1910–1914*	4	40	8.55	5.23	3.31	6.3
1915–1919†	7	58	6.00	4.39	1.61	7.7
1920–						
Totals.....	20					
Averages.....		48.8	7.96	5.64	2.32	6.53

* 3 books in this period omitted in average because devoted to textiles only.

† 2 books in this period omitted in average because devoted to textiles only.

TABLE IV

Distribution by Semi-Decades of Subject Matter Concerning Commercial Patterns and Their Use in Clothing and Textiles Texts Analyzed

PERIOD	NUMBER OF BOOKS	PER CENT OF ALL CLO. BOOKS	AVERAGE TOTAL PER CENT	AVERAGE PER CENT TEXT	AVERAGE PER CENT ILLUS.	AVERAGE NUMBER ILLUS.
1880–1884	1	100	0.20	0.20		
1885–1889						
1890–1894	1	50	0.26	0.26		
1895–1899						
1900–1904						
1905–1909	1	25	0.32	0.32		
1910–1914*	4	40	1.78	0.75	1.04	3.5
1915–1919†	9	75	2.96	1.90	1.06	6.6
1920–	2	100	1.70	1.46	0.24	2.5
Totals.....	18					
Averages.....		43.3	0.80	0.54	0.26	1.4

* 3 books in this period omitted in average because devoted to textiles only.

† 2 books in this period omitted in average because devoted to textiles only.

Economics of clothing and buying was used to include a number of subdivisions, such as discussions of clothing budgets, the selection and purchase of clothing, the Consumers' League, and labor conditions in relation to the production and consumption of clothing. With two exceptions the introduction of this subject into textbooks might be said to date from 1912; since then it has been given a widely varying proportion of space in nearly two-thirds of the books. The exceptions cited were two of the books previously described as having been primarily intended for the general consumer. As much as 12 per cent of one book, published in 1913, was devoted to these applications of economics, and as little as one-third of one per cent of a second book, published in 1918. The subject appears in both textiles and clothing books and is found included in the contents of 18 of the 43 studied. Since 1913 the average percentage per semi-decade has increased, a development most marked in the two publications dated since 1919. The illustrations used have occupied a very small proportion of space.

The pronounced increase in the use of ready-to-wear clothing has necessitated a consideration of all phases of selection quite aside from questions of clothing construction. The matter of quality, suitability, budget distribution, and similar points have attracted attention, especially since thrift has been stressed. Again we find a reflection of the growing recognition of the power and responsibilities of the consumer.

SUMMARY

This study has attempted to show the development of subject matter in clothing and textiles as determined by textbooks, and to ascertain the persistence and recurrence of fundamental topics developed by texts in this field. The outstanding facts of the study may be summarized as follows:

1. A large amount of textbook material concerning textiles and clothing has been published. The 43 books, which represent the available material, have been examined.

2. As to content and organization, in most cases clothing and textiles have been developed separately from other phases of home economics. Clothing has occurred alone about as often as it has been combined with textiles, while textiles texts have developed during the last decade. The subjects which have received major emphasis in the clothing field are, (1) sewing processes, (2) garment construction, (3) patterns and drafting, and (4) the care of clothing; in the textiles field, (1) textile fibers, (2) fabrics and their uses, and (3) textile manufacture.

3. A variety of different grades and kinds of schools have been planned for, but the books have been used interchangeably with considerable disregard of the purpose for which the text was written, and probably, to some extent, of the needs of the users.

4. The amount of emphasis placed upon the several major topics in these textbooks has shown marked fluctuations. These variations are not constant for all the topics, and are especially noticeable in the

case of patterns, drafting, and draping. The space allotted to sewing processes has declined while that devoted to garment construction has increased. Textiles has received a greater share of attention in the later books. Significant changes have also taken place in the minor subdivisions of this subject matter, as shown by the following illustrations. The sewing machine has been allotted an increasing amount of space which would still not seem to be proportional to the actual use of the machine. Drafting is given less space but has decreased in amount less than popularly supposed. The use of commercial patterns is coming to be an important subject, while remodelling is not stressed to any appreciable degree. The economics of clothing and buying has persisted in spite of noticeable fluctuations, and is increasing in amount.

5. Illustrations have increased in number and improved in quality.

6. Indexes and bibliographies are being used more freely, but a surprisingly large number of these volumes have omitted these as well as charts, graphs, and tables, which are only beginning to be used.

7. The dates of copyright of these books range over five decades, the earliest having been published in 1882 and the latest in 1921.

8. The size of these books, measured in 350 word pages, has averaged 200 pages. In general the total size of the books has tended to increase. The size of page has shown relatively little change, measured by the number of words per page, the average for the whole group being approximately 350 words.

The extent to which the data reported herein may be used as a guide in the preparation of new texts, or in the evaluation of texts now in use, may be limited until there are available adequate analyses of those problems pertaining to textiles and clothing which are included in homemaking and related occupations.

THE BOY'S AND GIRL'S ACHIEVEMENT CLUB

Leading educators urge a closer connection of the school with the home, the community, and the outside world. An extension program of achievement club work offers an admirable means of making this connection.

The best teachers feel strongly the need of meeting boys and girls on a footing of human companionship and fellowship in addition to the usual classroom footing. Working as a leader with an Achievement Club develops this companionship and fellowship in a very marked degree. Association in work and play is rich in humanizing and socializing results.

Character is the ultimate goal of all education. Character is the result, not so much of knowledge as of action. A good man or woman is the result of numberless good acts. Achievement work forms habits of good acting.—*Frank O. Kreager in the Journal of Education.*

EDITORIAL

To Members of the American Home Economics Association:

Your Executive Committee is very happy to announce that Miss Sweeny has promised to act as the Executive Secretary of the Association until the next annual meeting. The needs of the Association are so clearly urgent in certain directions that the Committee has asked Miss Sweeny to adopt a definite program of work rather than to accept the general responsibilities which are usually implied in an executive secretaryship. She has been asked (1) to promote the organization and affiliation of states not yet organized and to help states already affiliated with their programs of work; (2) to further the legislative program of the Association and to serve on the Women's Joint Congressional Committee; (3) to make such contacts with associations having related interests as may seem desirable for the development of our activities.

The Executive Committee requests that each affiliated state, through its president, send to Miss Sweeny at the earliest possible moment the following information: (1) the date of the next meeting; (2) the kind of help, if any, needed by the state; (3) names of persons in neighboring unorganized states on whom we can count to promote state affiliation; (4) a statement of the professional interests represented in the membership of the state association. The office of the executive secretary will be maintained for the present with the Journal Office at 1211 Cathedral Street, Baltimore. Miss Sweeny will also arrange for desk space in Washington to facilitate making the proper contacts there.

The program of work outlined for the executive secretary requires the active support of every member of the Association. Can we not set as our goals for the year (1) affiliation for every state, (2) fifty per cent increase in membership in states already affiliated, (3) a subscription to the JOURNAL from every member, (4) support of the financial plans for underwriting the executive secretary, (5) active interest in the program of work adopted at the Corvallis meeting (See November JOURNAL, p. 585) especially in making a study of organizations in the state with which we should work.

ALICE F. BLOOD,
President.

The Section of Social and Economic Sciences of the American Association for the Advancement of Science extends, through its chairman, Colonel Henry S. Graves, dean of the School of Forestry, Yale University, an invitation to all members of the American Home Economics Association to attend the sessions of the section at the Christmas meeting in Boston. The program of the section will have as its theme the conservation of our natural resources. Inasmuch as Colonel Graves hopes to interpret the meaning of our natural resources in terms of family as well as industrial welfare, the session will be of great interest to home economics women who are thinking along economic lines. A special leaflet giving details of the program may be obtained from our Association office.

The Bureau of Home Economics. In his stimulating address before the American Home Economics Association during its annual convention at Corvallis, the Honorable C. W. Pugsley, Assistant Secretary, U. S. Department of Agriculture, read the following announcement from the Honorable Henry C. Wallace, Secretary of Agriculture:

In addition to what you may say concerning our extension work in your address before the American Home Economics Association, I wish you would say to the members that we have in mind to greatly strengthen the scientific work of the Department as it may be related to home economics. Ultimately I have in view making the home economics work an independent bureau, ranking with the other bureaus of the Department, and placing at the head of it a woman of executive ability, thorough scientific training, and a broad and sympathetic understanding of what is needed to make such a bureau most helpful to the women of the land. I am quite sure that out of such a bureau will come an increasing fund of helpful information which can be taken to the homes through our extension activities.

Home economics women will be particularly interested in extracts from a letter from Mr. Pugsley to the JOURNAL in reply to a request for additional information:

The Secretary expects to ask the next Congress to approve the appointment of a Director of Extension Work in order to secure a closer coördination of all extension activities. A year ago Congress approved the appointment of a Director of Scientific Work and a Director of Regulatory Work. The work of the Department of Agriculture naturally and logically falls into these three divisions.

At the present time the Office of Coöperative Extension Work, which administers the work of county agents, home demonstration agents, and boys and girls club agents, is placed in the States Relations Service. The Office of Experiment Stations is also in this Service as is also the Office of Home Economics. In the reorganization it is proposed to put the Office of Experiment Stations under the Director of Scientific Work, the Office of Coöperative Extension Work under the Director of Extension Work, and to make of the Office of Home Economics a Bureau of Home Economics with a chief in charge who will be on a par with the chiefs of other bureaus, such as the Bureau of Animal Industry, the Bureau of Plant Industry, the Bureau of Agricultural Economics.

This is a very logical plan because investigation in home economics is a special line of work. Home economics constitutes, in fact, a subject matter division and should be treated as such. When it comes to extending the work of the subject matter division the work must all be correlated so that a balanced agricultural program results. This we propose to do through the reorganized extension work of the Department. Every subject matter division, including home economics, will have a part in the planning of the agricultural extension program.

So far Congress has appropriated its extension moneys for extension work in agriculture and home economics among the rural people of the United States. Undoubtedly as the science of home economics becomes better developed, Congress will see the necessity of extending the work to city women as well. The appropriations made to the Department for home economics investigational work do not confine the investigations to those of interest only to rural women but permit investigations in the entire field of home economics.

It is the Secretary's plan to place a woman at the head of the new Bureau of Home Economics if Congress approves the proposed change. This woman must naturally be one of thorough scientific training and of executive ability. He is anxious to get the best woman in the United States for this sort of work if she can be induced to take the position.

So far as making any announcement of the details of the organization of the Bureau I think you will readily see that this cannot be done at this time, for details have not been discussed. It will be necessary to use the Office of Home Economics as the foundation of the work. What changes are made in the subdivisions of this office, or in establishing new offices within the new Bureau of Home Economics, naturally should be made after the new chief is placed in charge. In general, about all that can be said is that the proposed Bureau of Home Economics should cover the field of home economics in as thorough a manner as is possible under the appropriation which Congress may make.

Tabloid Vitamins. The novelty of the vitamin theory has made it popular with the general public from the first. If one can procure these necessary substances in some easy form which does not disturb modern man's fixed habits of food selection, one piece of educational work has been lifted from the load of the nutrition teacher. The advertising propaganda of commercial vitamin preparations would indicate that this has been accomplished.

Two groups of investigators[1,2] working independently, have measured the potency of several such products of seeming popularity. Their efficiency as carriers of vitamins B and C has been studied by noting the effect of their addition to experimental diets of rats, guinea pigs, and pigeons. The conclusion of both groups is that these tablet forms of commercial preparations contain so little of the vitamin claimed as to be worthless and are furthermore frauds because of extravagant statements on the labels.

The power of suggestion has been known to help along the work of many a medicine. If these vitamin tablets are effective at all when used by man even though their effectiveness can be said to lie only in the faith of the user, perhaps the dollar is well spent; but encouraging the public to think that it can obtain vitamins and health in this fashion is a barrier to the teaching of sane food habits. The place to secure vitamins is the grocery, the dairy, and the market, not the drug store.

SYBIL WOODRUFF.

Correction. The author of "The Teaching Load," printed in the October JOURNAL, regrets that, due to unavoidable delay in the return of the corrected proof, certain reports were omitted and one erroneous statement was made.

The staff for Colorado Agricultural College should read—7 full time, 2 part time, student assistants. University of Minnesota registration should read—total 15726; women 6133; home economics majors 358; per cent of women in home economics 5.8; ratio of teaching staff to home economics students 1:14. The Utah State Legislature in 1921 removed from home economics, in the University, restrictions which confined work of the course to such as was demanded for teacher training purposes, which was construed as freshmen and sophomore work.

[1] Hess, J. H., Moore, J. J., Calvin, J. K. Experimental studies with proprietary vitamin products. Jour. Amer. Med. Assn., 78, 1441 (May 13, 1922).

[2] McCollum, E. V., and Simmonds, N. Potency of commercial vitamine preparations. Jour. Amer. Med. Assn., 78, 1953 (June 24, 1922).

OPEN FORUM

A Christmas Project. *The Christmas project of Duluth Denfeld High School is described in detail in order that other schools may consider such an undertaking in making their own Christmas plans.*—EDITOR.

Owing to the financial crisis, school opinion pointed to the repair of what material could be gathered together, rather than taking a cash donation for the purchase of new clothing, toys, and food. There then arose the problem of gathering together old clothing, hats, coats, shoes, broken toys, kiddie kars, and dolls; repairing them and distributing them to the homes where they were most needed.

One of the school committees is a welfare committee composed of five members of the faculty and a group of students. This committee was divided into sub-committees to collect old materials, repair them, take charge of free will offerings, gather names of needy families, and distribute gifts.

Huge boxes were placed in conspicuous places at the two entrances of the school, so that students might deposit their gifts quietly and easily as soon as they entered the building. Every day there was a box overflowing with a heterogeneous mass of shoes, sleds, skates, dolls, rubbers, coats, sweaters, etc. It was the duty of one student member of the committee to unpack the boxes, separate the gifts, and bring each group to its proper department for repair.

All of the wooden toys were repaired in the woodwork department, and repainted by the members of the art department. Many a cast off kiddie kar and sled was made just as durable and just as attractive as the shiny new ones offered for sale in the down town toy shops.

Wigs of real hair were applied to dolls which had lost their own hair in the struggle of life with their three year old mistresses. The blush of youth was restored again to the cheeks of the dolls from which Fido had licked the paint the summer before. Such a healthy looking group of dolls was never seen before.

One of the local stores donated a huge box of broken toys and dolls. These toys were new but had been damaged in transit. They were soon restored to their former fitness and beauty.

The sewing department volunteered to repair the clothing and to dress the dolls. Since there was not enough class time to do both of these things the girls volunteered to dress the dolls at home. The clothing repair work was a big job and fitted in nicely with the course of

study which allows for some time to be spent on care and repair of clothing. The whole sewing room was converted into a great sewing shop, laundry, and dry cleaning establishment. Before class each day the instructor went over the garments to be repaired and labeled each one with a list of needed repairs. When the students assembled, each girl was given one garment; she read on the label the thing to be done to it, took her thread from a general supply table, and went to work immediately. At the end of ten days, we had a huge rack of suits, coats, and dresses, all cleaned, mended, pressed, and ready for distribution. In addition, there were dozens of suits of underwear, sixty pairs of stockings, several sweaters, and a dozen caps.

Sixth grade students made a score of cloth cats and dogs. Pieces of blue working shirts, good portions of old turkish towels, and gray outing flannel were used for the covering. Features were done in a contrasting mercerized cotton. They were stuffed with sawdust from the Manual Training department.

The last day of school, a free will offering was taken either in money or food. The result was fifty quarts of canned fruits and vegetables, forty glasses of jelly and conserve, flour, breakfast food, sugar, and a silver offering which was spent for coal, sugar, flour, potatoes, some underwear and hose. Every basket contained a piece of meat, potatoes, flour, breakfast food, jelly or canned fruit, clothing, and toys.

It was not difficult to find names of needy families. A small mail box was put in the hall into which a student could drop a slip of paper containing the name of the family, number of children, ages, and needs if possible. This list of eighty-five families was carefully checked with the Salvation Army, Associated Charities, and the Goodwill Society to avoid duplication.

The Friday before Christmas, the distribution committee, consisting of two teachers and a number of students, packed boxes, fitting the clothing, toys, and food to the needs of the family. Boys who drove cars saw to it that the baskets were delivered.

It was estimated that the students of Duluth Denfeld gathered together about six hundred dollars worth of Christmas gifts and had made eighty-five families happy on Christmas day.

BERNETTA SEIPEL,
Duluth Denfeld High School,
Duluth, Minn.

BOOKS AND LITERATURE

A Nursery School Experiment. By HARRIET M. JOHNSON AND CARMEN S. REUBEN, Bureau of Educational Experiments, 144 West 13th St., New York, 1922, pp. 82. $.75.

This report, descriptive of the first three years of the Nursery School established by the Bureau of Educational Experiments, is written by Harriet M. Johnson, Director of the Nursery School, with a section on music by Carmen S. Reuben, a member of the Nursery staff.

Largely because of their intimate contact with the children in the Nursery School, their report is as refreshingly free from statistical tedium as it is full of human interest—the sayings and doings of a group of eight children between fifteen months and three years of age, who, in the thirty illustrations vivifying the report, make the irresistible appeal of childhood at play.

Why the Bureau wants such young children is answered by Mrs. Lucy Sprague Mitchell in the introduction. She says that, unlike the Day Nursery or the English type of Nursery School, the Bureau's Nursery School was not established primarily to meet a social or an economic need, but rather an educational need, that is, the need (1) to study the educational factors in the environment of small children, and (2) to gather, for purposes of research, scientific data concerning their growth.

This does not mean that the physical needs of the children are neglected, for, as a matter of fact, they are most scrupulously attended to in conformity with the most advanced practice of the medical profession, but that is not the field in which the Bureau's experimentation is taking place. Its experiment has to do with the equipment and situations which, in their reaction on the children, lead to muscular coördination, to experimentation, to purposeful activities, to emotional stability. The record of this interplay between the children and their environment forms the scientific data which the research staff of the Bureau is using to the end that the knowledge gained may be converted into an educational procedure more fully adapted to the needs of nursery children.

The writer of this review knows of no other educational experiment in this country where children under three years of age are placed in so homelike an environment adapted to the needs of childhood; where there is such close coöperation between members of the teaching staff and specialists; where the records kept are so human and yet of so exact a nature that it is possible for both mothers in the home and scientists in the laboratory to make use of them.

Because of the home, as well as the scientific, aspect of this Nursery School, it is, without doubt, destined to have a widespread influence upon the pre-school groups of children fast forming throughout the country. Particularly is this true in regard to demonstration nurseries for child care and training which are being established in connection with Homemaking Courses. For these nurseries this Nursery School may well serve, either in whole or in part, as a pattern.

It is plain that, with leaders in this new educational field eagerly looking for scientific data to guide them, this report of the Nursery School becomes of immediate value. It also has permanent value as source material of an unusually reliable nature, not only because of the efficiency of those conducting the experiment, but because they are able to so control the conditions under which they are working as to keep their educational aim paramount. In short, by publishing this descriptive report of its Nursery School the Bureau of Educational Experiments has made a valuable contribution in a new educational field.

ELIZABETH JENKINS.

Transactions of the Twelfth Annual Meeting of the American Child Hygiene Association. American Child Hygiene Assn., 532 17th Street, N. W., Washington, D. C. $3.00.

The addresses, discussions, and reports presented at the twelfth annual meeting are included in this volume. The following divisions will give an idea of the value of these proceedings to the home economics worker: Medical, Nursing and Social Work, The Child of Pre-school Age, Coördination of Child Health Activities, Health Education, Problems and Opportunities of Lay Directors of Private Organizations, Rural Problems.

Modern Millinery. By HESTER B. LYON. New York: Millinery Trade Publishing Co., 1922, pp. 200. $3.00.

In this book, Miss Lyon has emphasized the points of workmanship and artistic feeling, which, in view of her extensive class room and shop experience, she has found to be essential to successful millinery work. While sufficient attention has been given to detail to insure correct technique, the author has succeeded in permeating the book with an appreciation of the broader and more subtle phases of the subject.

The contents of the book should prove to be of permanent value to both teachers and milliners as they deal with the underlying principles of millinery, regardless of changing styles. The problems chosen are typical, the subject matter is clearly and adequately stated, and the illustrations given are unusually helpful. In short, the book is a masterly treatment of the construction processes of millinery.

HARRIET J. HEWITT,
High School of Commerce, Springfield, Mass.

Calcium Requirements of Children. By H. C. SHERMAN and EDITH HAWLEY. A reprint of the article in the September JOURNAL. 10 cents a copy; 10% discount on orders of 20 or more. Order from the JOURNAL Office.

Nutrition. The two pamphlets, "Height and Weight as an Index of Nutrition," and "Nutrition and Adequate Food Allowances for the Family," referred to in the July JOURNAL as obtainable from the A. I. C. P., are also distributed by the Brooklyn Bureau of Charities, Charity Organization Society of New York, United Hebrew Charities of New York, New York Nutrition Council. The pamphlets are 25 cents a copy.

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NEWS FROM THE FIELD

The American Dietetic Association held its Fifth Annual Convention at the New Willard Hotel, Washington, D. C., October 16–18. The members of the Association were the guests of Johns Hopkins Hospital on October 19, and 250 persons went over to Baltimore for this occasion.

The convention was well attended and the program was so arranged as to interest the various groups at the meeting. Dietitians whose work is dieto-therapy had the privilege of hearing excellent addresses by Dr. Elliott P. Joslin, Boston; Dr. Philip L. March and Dr. L. H. Newbury, University of Michigan; Dr. Wm. S. McCann and Mrs. Agnes O'Dea, Johns Hopkins Hospital.

Nutrition and social workers were particularly interested in addresses by Dr. Mary S. Rose, Teachers College; Dr. Alfred Hess, New York; Laura Comstock, Rochester; Lucy Gillett, A. I. C. P. New York; Anna L. DePlanter, Child Federation of Philadelphia; Daisy Treen, Boston; Dr. E. V. McCollum, Johns Hopkins University; Ida M. Cannon, Massachusetts General Hospital; and Dr. Walter Cannon, Harvard Medical School.

Special papers for administrative dietitians on food service and food costs were presented by Marjory Hulsizer, Barnes Hospital; Mary Lindsley, Grace Dodge Hotel; Henry C. Wright, New York; Laura M. Piper, New York; Dr. Leroy E. Parkins, Peter Bent Brigham Hospital; Dr. J. W. Hayes, New York. Emma Gunther and Ray Balderston, Teachers College, told of their work in China and of the possibilities there for dietitians.

The work of the Association during the year was presented at the section sessions. Breta M. Luther and Rose Straka reported a survey on courses for student dietitians in hospitals in the U. S. and Canada having more than 100 beds and an accredited training school for nurses, and a survey of courses in dietetics for student nurses in 20 selected institutions. Dr. Ruth Wheeler discussed the findings of these reports as they bear on the organization and management of a dietary department. Octavia Hall presented a survey of food costs per capita in 50 selected institutions. Gertrude Gates Mudge presented the report of an intensive survey of Italian dietaries in New York, Boston, Detroit, and Memphis.

At the dinner meeting the Association had as its distinguished speakers Surgeon-General Ireland, U. S. Army; Asst. Surgeon-General Smith, U. S. Public Health; Major Stimson, Army Nurse Corps; Miss Noyes, A. R. C.; Miss Minnegerode, U. S. Public Health; Mrs. Corsette and Colonel Whitledge, Veterans Bureau.

Mrs. John D. Rockefeller, Jr., entertained the Association and Washington guests at tea at the Grace Dodge Hotel. The entire meeting was characterized by the keenest interest and enthusiasm and indicates a future of work useful to the profession, on behalf of this vigorous young organization.

American Child Hygiene Association. A program of much interest to all Home Economics administrators, teachers, and students was presented at the Thirteenth Annual Meeting of the American Child Hygiene Association in Washington on October 12th to 14th.

As an indication of the increased recognition of nutrition as a factor in all phases of health work today it is very gratifying to find that the topic for discussion of the first morning of the meeting was The Training in Nutrition Needed for Child Hygiene Workers. Dr. Alice Blood presided at this session.

The program was as follows: Some of the Problems in Training Nutrition Workers, Flora Rose; Nutrition Training for General Field Workers, Edna White; Training Needed by Nutrition Workers for Public School Service, Emma Dolfinger; Discussion, Margaret Sawyer and Katherine Pritchett.

Summary of the main points in papers and discussions:

1. The training of nutrition workers as a problem really exists. Our training schools have given a fundamental knowledge of nutrition, but have failed to give a knowledge of nutrition which functions.

2. A functioning knowledge of nutrition should include ability in and knowledge of administration and organization of community resources.

3. It is desirable to give instruction in nutrition to public health nurses and social workers. Such field workers require, however, the supervision of a more highly trained specialist in nutrition.

4. We must give a clear idea of feeding a *normal* child, especially to the nursing profession.

5. A nutrition class should not be conducted as a clinic. It should be a beacon light to show the way to health for everyone.

6. Before we can give nutrition to the community and to the school we must educate our educators as to the meaning and value of nutrition work.

The Home Economics Section of the Association of Land-Grant Colleges, with Louise Stanley as Chairman, met in Washington the week of November twentieth to discuss administrative problems. A report will appear in the next number of the JOURNAL.

The General Federation of Women's Clubs has established permanent headquarters at 1734 N. St. N. W., Washington, D. C.

American Association of University Women. Ruth Hawthorne French has been elected to succeed Mrs. Martin as Executive Secretary. R. Louise Fitch has been appointed to direct the membership campaign. Miss French and Miss Fitch have established offices at association headquarters in Washington.

Women's Foundation for Health. The delegates from the American Home Economics Association to the House of Delegates of the Women's Foundation for Health, New York City, November 21 and 22, were Mrs. Mary Swartz Rose, Teachers College, Columbia University, Secretary; Elizabeth Condit, Pratt Institute; Annie Macleod, Vassar College; Mrs. J. B. Short, President of the Home Economics Association of Greater New York.

The Executive Secretary. The announcement of Miss Sweeny's acceptance of the Executive Secretaryship is made in the editorial pages of this issue of the JOURNAL. Miss Sweeny has already made tentative plans for meetings with all the unaffiliated states, and has completed her November itinerary as follows:

November 4, Detroit: Conference with Miss White regarding the program of the mid-year meeting.

November 6, East Lansing: Addressed the Women's Club.

Conference with Miss Gettemy, President Michigan Home Economics Association.

November 8 and 9, Milwaukee: Addressed the Teacher's Institute at the invitation of Miss Babcock, City Supervisor of Home Economics.

Addressed the students at Milwaukee-Downer College at the invitation of Miss West, Director of Home Economics.

Conference with the Council of the Wisconsin Home Economics Association.

Addressed the Home Economics Section of the Wisconsin Teachers Association.

November 10, Chicago: Conference with Dr. Blunt and Program Committee regarding annual meeting.

November 11, Ames: Conference with Iowa Home Economics Association regarding the completion of affiliation and plans for work.

November 14–15, Manhattan: Conference with the Kansas Home Economics Association.

November 16–17, Kansas City, Missouri: Conference with the Executive Committee of the Missouri Home Economics Association.

November 20–22, Washington: Meeting of the Association of Land-Grant Colleges.

November 28, Syracuse: Addressed the New York Home Economics Association.

November 30, Detroit: Mid-year meeting of the American Home Economics Association.

College Entrance Credits in Commercial Subjects. In consideration of the increasing number of students in commercial classes in secondary schools, and of the increasing demands of industry and commerce for better trained personnel, the committee, appointed at the second Commercial Education Dinner Conference held by the United States Bureau of Education in conjunction with the Vocational Education Association of the Middle West, recommended to that association, for endorsement, the following:

1. A declaration of policy which will best encourage and enable students to continue in higher institutions their preparation for business, thus assuring to industry and commerce a constant and adequate supply of efficient personnel, trained in particular for supervisory and management positions; and to this end that secondary schools and colleges and universities, working jointly through customary agencies, effect such a revision and articulation of secondary commercial education with higher education as will achieve this object.

2. That the commercial course in secondary schools include the three following sequences: English, social sciences, and mathematics and science (commercial geography may be offered as a part of the mathematics-science sequence if not presented in the social science group); that a minimum of three units be offered in each of these sequences.

Note: One unit of business English may be offered in the English sequence. One unit in United States history and civics shall be included in the social science sequence. Social science may include: industrial history, commercial geography, commercial law, salesmanship, and economics. One unit in commercial arithmetic may be offered in the mathematics-science sequence.

3. And further, that whenever elected at least two units must be taken in any one of the following technique groups: (a) accounting, (b) secretarial, (c) merchandising.

The Association to Promote Proper Housing for Girls, through its Bureau of Rooming and Boarding Houses, refuses to recommend any girl under twenty-five years of age to a house which does not contain a parlor for the reception of guests. Provision of a parlor has been included in the set of standards adopted by the Hostess Club made up of landladies registered with the association.

Other standards adopted for the benefit of both the guest and the hostess determine the rate of rent in regard to location of house, size, position, and furnishings of the room; valuation of property and overhead expenses; method of payment; rates for visiting guests; regulations covering use of electric iron; care of room; and provision of linen, bed covering, and other accessories. The Hostess Club meets once a month to foster coöperation among it members and to keep its standard up to the minute.

A study of living conditions made by the association resulted in the organization of self-governing Girls' Community Clubs in rooming sections of the city. Sunday teas to introduce new members, card evenings, and hiking parties are some of the social activities provided.

Anilin Dyes. The first attempt to standardize American anilin dyes used as stains in bacteriological work was made by the Society of American Bacteriologists. With the assistance of certain dealers in biological stains they have been working on the matter for about a year and find that American manufacturers have met the bacteriologist's needs in an admirable way. The work of the bacteriological society appeared so important that the National Research Council offered to take it over so as to place facilities at the disposal of the worker which were not available to the bacteriological society alone. The work has been organized with the cooperation of the Department of Agriculture and several national scientific societies. The hope of the committee is not only to standardize the stains but to secure the production of biological stains

in this country decidedly better than those available before the war.

ALABAMA

Polytechnic Institute. While the Alabama Polytechnic Institute has been coeducational for many years, it had been more in a nominal way up to the beginning of the 1921–22 session. This year with Miss Harris in the position of Dean of Women and State Home Demonstration Agent, rapid developments in women's work are expected. The training of county home demonstration agents will greatly strengthen the excellent home demonstration work being done in Alabama.

Announcement has been made by Helen Green, Head of the Home Economics Department that, in coöperation with the State Home Economics Association and the Extension Service through the district and county home demonstration agents, definite plans are now under way for the establishment of a uniform course in dress making in the high schools of Alabama.

In addition to making this course uniform in the high schools it will also be carried to the girls in the rural sections by the county home demonstration agents.

At a recent meeting of the State Home Economics Association Miss Green was made chairman of a committee on dress making, and is therefore taking the lead in establishing this course in the high schools.

ARIZONA

University of Arizona. All graduates in home economics last June have secured teaching positions for the present year. All but one accepted positions in the state.

The Home Economics Practice House has secured a two year old boy who has become a member of the house family for the first semester. This child was selected for the purpose of teaching the choice of foods for children, and food habits and discipline.

Conference. Before the public schools of Arizona opened, Kate Bear, Supervisor of Vocational Home Economics, called a conference of home economics teachers for the purpose of outlining the state plans and requirements and stimulating coöperation among the teachers of the state. The response and interest of the teachers insured the success of this conference.

FLORIDA

A Woman's Conference was held at Florida State College for Women, September 4–8. The members of the conference were home demonstration agents, state board of directors of the Woman's Club, and other home economics workers.

The Omicron Nu fraternity was installed at Florida State College for Women on May 4 with an active membership of seven.

IDAHO

University of Idaho. The vacancies caused by the resignation of Zella E. Bigelow, Associate Professor of Clothing, Hallie E. Hyde, Associate Professor of Foods, and Janet Scott, Supervisor of Practice Teaching, were filled by the appointment of Ruth Patchin, Montana Clothing Specialist; Ramona A. Pease, Columbia University; and Florence Sly, University of Minnesota.

INDIANA

Home Economics Extension. A revelation of what a county can do without the help of a home demonstration agent was illustrated by the exhibit made at a recent County Product Show in Noble County. The women of this county, which has twelve townships, undertook to show what each township was doing with its local organization and occasional visits from extension specialists.

Each township put on an exhibit, which was judged by the following score card: Education value, 25; quality 25; arrangement 25; appropriateness 25.

Some of the titles may prove suggestive: *Practical Nursery*—a home nursery, with inexpensive yet complete equipment. Demonstrations on the care of the child. *The*

Thrashing Dinner—a table set with a meal, which would be satisfying and easily prepared and served. Suggestions for typical meals. *The Ideal Sewing Room*—necessary equipment; demonstration. *The School Child*—exhibits of well planned lunches, contrasted with unsuitable ones. Appropriate school garments contrasted with unsuitable ones. Ways in which a school child may help mother. *In the Kitchen*—suggestions for making the *Meal in the Kitchen* attractive.

The Exhibit at the Indiana State Fair, Indianapolis, September 4–9, featured clothing projects. The homemade dress form and its use were emphasized. An exhibit which attracted much attention was a ready-made dress, its sale price attached, and a homemade dress, copied from it, using the same materials, and effecting a saving of forty dollars.

As a result of the forty-eight two-day millinery classes that have been held in the past year, numbers of hats made at these schools were displayed, with posters showing the cost.

The home economics extension service also coöperated with the dairy division in the milk project, and with the horticulture representives in the beautifying of home grounds program.

New workers in home economics extension are Madeline Connor, Foods Specialist; Neva Stephenson, Girl's Club Leader; Aneta Beedle, Assistant, to coöperate with the milk demonstration work of the dairy department.

Purdue University. The first meeting of the Home Economics Club at Purdue University was well attended. The group is enthusiastic over the prospect of the year's work in the New Home Economics Building. Professor Mary L. Matthews talked on the "Opportunities in Home Economics." Each member of the home economics faculty was introduced.

New members of the staff are Katharine McFarland, instructor in Institution Administration and Foods, and Marie Schrass, assistant in Clothing and Textiles.

Since September, 1921, Indiana has been devoting part of her Experiment Fund to research work in home economics. The personnel of this new department is made up of Mr. G. I. Christie, Director of Agricultural Experiment Station, Professor Mary L. Matthews, Chief of Department of Home Economics in the Experiment Station, and Ruth Jordan, Assistant in the Department of Home Economics in the Experiment Station. In most colleges members of the teaching staff of the department are too busy to carry on investigation or research except in a very limited way. Just as the practical farmer looks to the Experiment Station workers for help in solving his problems, so the practical housewife should have some place to which she might look for assistance. During the short existence of this department it has solved dozens of problems for Indiana women.

IOWA

Iowa State College. Ten members of the Home Economics Division attended the convention at Corvallis.

Twelve weeks unit courses are being offered for homemakers this year. They include foods, nutrition, clothing, and household management.

Dr. Mary Sheldon has been added to the hospital staff to assist in caring for the health of the college women. Every freshman is given a thorough physical examination and attention is provided for those who need special diet or corrective gymnastics. A strong, constructive health program is under way.

The number of women registered this fall is about 1050. An informational test in home economics was given every freshman student registered in the Home Economics Division in addition to the regular intelligence tests which have been given at the beginning of each year for several years.

The sorority houses are benefiting by the centralized buying plan which has been started under the direction of the Stewards Club.

KENTUCKY

The Kentucky Home Economics Association held its annual meeting October 13–14 at Louisville, Maybelle Cornell, president, presiding.

A session was given over to each of the following departments: Extension, Homemaking, Health, Teaching, Institutional.

Some of the general subjects discussed were The Health Program, The Bureau of Child Hygiene, Boys' and Girls' Club Work.

There was a large attendance, and over twenty new members were added to the association.

MICHIGAN

Nutrition Classes. In September, 1921, nutrition work was started in Michigan City under the direction of Pearl Henderson. The Women's Study Club of the city sponsored and financed the work for the year in eight public and three parochial schools. Prior to this time there had been no intensive health work carried on among the children and their parents, and there were no public agencies which had given medical relief of a constructive nature.

The nutrition worker made a survey of the children in all of the schools with the following results:

Public Schools

	Girls	*Boys*
Total number weighed.....	1178	1214
Total number 7 per cent or more under weight for age or height.....	638	647
Percentage under weight.....	54.1	53.2

Parochial Schools

Total number weighed.....	635	598
Total number 7 per cent or more under weight for age or height.....	375	351
Percentage under weight.....	59.0	58.7

Total number children, 4–17 years, weighed and measured, was 3625, the total number 7 per cent or more underweight was 2011, showing 55 per cent of the children in the schools to be so undernourished that they should have special attention and care.

Nutrition classes were organized in different schools as quickly as possible, though the worker had only volunteer assistance in the making of charts. The children were measured every four weeks and weighed each week at a regular time. The class met for 15 or 20 minutes per week for instruction in food and health habits.

The physical examinations of the 290 boys and girls in the nutrition classes showed the following histories:

Insufficient rest, 63.4 per cent
Closed windows in sleeping rooms, 32.4 per cent
Insufficient vegetables, 50.6 per cent
Insufficient fruits, 49.6 per cent
Insufficient cereals, 47.5 per cent
Coffee or tea drinkers, 82.7 per cent
Do not clean teeth, 36.8 per cent
Diseased tonsils or adenoids, 33.8 per cent
Decayed teeth, 65.3 per cent
Defective vision, 33 per cent

The habits of the nutrition class pupils are typical of the 55 per cent who were undernourished.

After nine months the children showed a gain in height of 117.7 per cent and 108.5 per cent in weight. A group of ten pupils in the nutrition classes who were defect-free or had defects corrected early in the fall made a gain of 141.67 per cent in height and 249.1 per cent in weight.

A reweighing and remeasuring of the 3625 boys and girls showed the public schools to have made a higher percentage gain than the parochial. In the parochial schools, 1061 boys and girls who were weighed in September and again in June, made an average gain of 117.3 per cent in height and 95 per cent in weight. In the public schools, 2048 who were weighed in September and again in June, made an average gain of 114.8 per cent in height and 108.1 per cent in weight. In the public schools the hours are shorter than in the parochial, because the church instruction is omitted. The public schools are more modern and have better ventilating and heating systems. There was some physical training included in the program.

Throughout the year meetings were held in the schools for parents of undernourished children. The majority of the 250 who attended these meetings were the parents of public school children. There is a great need for more health work among the parochial and public schools. It has been very evident during the year that the correcting of undernourishment requires a closer coöperation between the dietitians and physicians.

MISSOURI

University of Missouri. There was a conference of the vocational teachers of home economics held in connection with Junior Farmers Week at Columbia, November 2–4. This was widely attended by teachers from all parts of the state.

In order to help provide the various county fairs with competent judges, the department of home economics has compiled a list of trained women who can give some time to attending the fairs and judging products. When requests for assistance come to the University, addresses of the women living in or near the county are sent to the Fair Board. The scheme has worked well for three years.

The State Home Economics Conference of Missouri met in Kansas City November 15–18, in connection with the State Teachers Association. The president of this section is Ella Groenewold of Warrensburg State Teachers College, and the Secretary is Clare White, supervisor of home economics for the state.

NEBRASKA

High School Dormitory. There are a number of county high schools in Nebraska, in which the housing of non-resident students is a growing problem. To meet this situation, the patrons of Rock County have erected a girls' dormitory, providing rooms for approximately twenty-five students. Unfurnished rooms with light and heat are available, rent free, to non-resident students of the county. A matron is in charge, and board is furnished at cost. The plan of having the home economics laboratories in the girls dormitory, with the food classes taking a large responsibility in the planning and preparation of meals, is believed to be a practical one. The Home Economics Section of the State Board for Vocational Education, coöperating with the Agricultural Engineering Extension Department, is working out tentative plans for such buildings.

Nebraska Wesleyan University. By a coöperative arrangement with the public schools of University Place, the University has started a course in home management practice in the Domestic Arts Home belonging to the public schools. A group of three senior college students, with Lemo Dennis of the Wesleyan faculty, live three weeks in the Home, taking full charge for this period. The family provided for by these girls consists of their instructor, Miss Dennis, the two home economics instructors in the University Place High School, Miss Fortna and Mrs. Fuller, and Mrs. Fuller's son who is 14 years old.

The State Educational Association held its fall district meetings in the six districts of the state, October 12–14. At each of these meetings the new state home economics association held section meetings.

The University of Nebraska has 237 girls specializing in its course in home economics and 55 others electing one or more home economics courses. 58 senior girls will be graduating from the department this year to become teachers, commercial workers, institutional managers, extension workers, and dietitians.

Eleven graduates of the University of Nebraska attended the American Home Economics Association meeting at Corvallis.

Anna Dee and Lydia Swanson, seniors in the Home Economics Department, are spending the first term of this year at the Merrill Palmer school in Detroit taking courses in Child Care and Management.

The Home Management House has a two year old boy in its family circle. Last year the girls took a six months old girl to care for. They hope this year to get experience in the training of the child in addition to the problem of physical care which they had last year.

New members of the home economics staff are Ruth Staples, in charge of home management courses, and Myrtle Easley, millinery specialist with the Home Economics Extension Service.

NEW ENGLAND

The New England Home Economics Association held its first fall meeting at Massachusetts Agricultural College, Amherst, October 14, 1922. A report of the American Home Economics Association meeting at Corvallis, and a paper on Flower Arrangement by Professor Clark Thayer, were followed by a tour of the campus and a luncheon arranged by Lucile W. Reynolds. The Contribution of Economics to Home Economics by Lorian P. Jefferson, Assistant Research Professor in Agricultural Economics, and The Contribution of Sociology to Home Economics by President Kenyon L. Butterfield, formed the afternoon program.

The Social Service Section met October 28 at Girls' City Club, Boston. This was a get-together meeting with exhibition of poster material for social service workers.

Eastern States Exposition at Springfield. This year, in addition to the six boys and six girls representing the club teams of each of the ten Eastern States, three boys and three girls came from Maryland, West Virginia, and Virginia. These teams demonstrated their projects in homemaking and agriculture. May B. Van Arsdale and Mary I. Barber of the Foods and Cookery Department of Teachers College attended the exposition as members of the Advisory Board of Camp Vail.

Vacation Canning Classes. The Public Schools in Boston are opening their doors more and more each year to the children who must spend the two long summer months of the school vacation in the city, for in the city means largely in the streets. Classes are held where children who are behind in their work may review their studies for the next winter. Play grounds are kept open and sufficient and competent teachers provided to keep the children happy and busy with athletics, games, dramatics, and story telling. In addition to these activities special project classes are opened in gardening, canning, basketry, furniture repair, toy-making, and sewing. The work is wholly voluntary, each child choosing his own project and working at it as many mornings a week as he wishes, and the limited time and space allow.

From one family three children, two girls and a boy, came two mornings a week for six weeks to canning class. Their father had a garden. Those three children canned eighty quarts of fruits and vegetables.

For canning classes of about fifteen children, one teacher is provided. Where more children crowd in, sometimes twenty-five or thirty a day, two teachers are provided. The children bring whatever they wish to can, being guided in choice by the teacher. They may bring jars and rubbers from home or buy them at the kitchen. Some of the teachers buy fruits or vegetables at wholesale for the children. The equipment is simple, most of it being found in any school kitchen. By sorting out the necessary summer utensils from the rest of the kitchen equipment and using these alone, the equipment can be returned easily and if necessary replenished at the end of the season. One kitchen was opened for the first time in the summer of 1921, the initial cost to the city being the price of two boilers, racks, and tongs. The necessary kitchen equipment such as knives, saucepans, etc., was taken from the homemaking department of the school and returned at the close of the summer. About $2.00 was spent to replenish this equipment and three dollars for running expenses. The kitchen was kept open three days a week, two teachers being on duty for six hours each day. The city paid for the services of the teachers and a janitor, and for gas and water. Forty children attended regularly twice a week and twenty more enrolled for brief periods. Six hundred quarts of fruits and vegetables were canned in that kitchen, about sixty per cent of the products coming from the gardens of the neighborhood. The work was in charge of Lucy H. Nash.

NEW YORK

The New York State Home Economics Association met in Syracuse, November 27–28. A report of the meeting will appear in the January JOURNAL.

The Home Economics Association of Greater New York held the first meeting of the year at Teachers College, October 25, after a dinner served by the Foods and Cookery Department. Mrs. Jenoise Brown Short, president, presided. Marie Sellers reported the Corvallis meeting, and Emma Gunther and L. Ray Balderston told of their experiences in China.

Home Economics Exhibit. The Home Economics Association of Greater New York conducted a booth at the First Annual Exhibit of Women's Activities held under the auspices of The Business and Professional Women's League, at the Hotel Commodore, New York City, September 18–23. One of the objects of this exhibition was to present to young women the various activities which are open to them. The committee felt it advisable to present a different phase of home economics work each afternoon and evening of the show and a program was arranged accordingly. This program was announced on a large card, and visitors gained some idea of the field covered during the week.

On Monday afternoon, Mrs. Jenoise B. Short, President of the Home Economics Association of Greater New York, talked on home economics journalism. In the evening Matilda McKeown of the New York Public Schools and Elizabeth Condit of Pratt Institute illustrated the financial end of housekeeping by the use of budgets. Tuesday afternoon, Mrs. Henrietta Dursee Robinson discussed homemaking as a profession, and in the evening Miss Diehl and Miss Rogers of Pratt Institute discussed practical courses in homemaking.

Wednesday was devoted to the activities of home economics women in hospitals, and interesting exhibits were arranged. Miss Howard, dietitian of Bellevue Hospital, described the administrative work of a dietitian in a large institution; Miss Lautz, dietitian of Presbyterian Hospital, emphasized the specialized work of dietitians in dieto-therapy, and showed several special trays and the equipment for weighing foods accurately.

Miss Fisher of the Department of Household and Institutional Administration, Teachers College, had charge of the program for Thursday. In the afternoon Mrs. Shafer of the National Bank of Commerce and Miss Knight of Newark discussed the work of feeding large groups in business institutions and schools. In the evening, Miss Fisher outlined some typical positions that are open to women in the management of large group living activities and discussed some of the more recent developments in specialized work for women.

Friday afternoon, Miss Bowman and Miss Lyon, Pratt Institute, outlined courses of training and types of positions open to women in the field of dressmaking, textiles, and millinery. Dolls were shown dressed in interesting period styles. Friday evening, Miss Gillett of the Association for Improving the Condition of the Poor told of the activities of nutrition workers in the home and schools. Charts and other material were shown.

On Saturday afternoon, Miss Holloway, Pratt Institute, discussed courses in foods and cookery for the home and institution. In the evening a marketing exhibit was arranged, under the supervision of Miss Van Arsdale, by Miss Parish and Miss Yackey of the Department of Foods and Cookery of Teachers College. Various commercial brands of food in small and large packages were shown and their prices compared to convey the idea that it pays for food buyers to accustom themselves to a knowledge of weights given on labels, and the price paid per actual ounce or pound. Mimeographed material was distributed, giving practical suggestions for wise marketing.

It was the consensus of opinion among those in charge that the exhibit had been of considerable value in educating the public as to the scope of home economics work.

Plans for the entire demonstration were in charge of Mary Pascoe Huddeson.

The Second Annual Summer Session for State Home Economics Teachers, held at Buffalo Normal School, was planned to meet the needs of two distinct groups of teachers; first, those who already were qualified as teachers in home economics but desired further improvement in methods and up-to-date subject matter; second, those who were not fully qualified but in need of both subject matter and professional courses. The majority of the 105 students enrolled were in the second group.

Of the thirteen members composing the faculty, four were from the regular faculty of the Buffalo teacher training center, four from outside of the state, and the remainder from other institutions and schools in the state. Treva Kauffman, State Supervisor of Home Economics, was director of the session.

The following courses were given:

1. Professional courses: organization and teaching of homemaking in the evening school, correlation of English with homemaking for the foreign-born woman, project method of teaching, principles and problems of part-time education, teaching general subjects in part-time schools, homemaking in the part-time school, the organization and conduct of state aided courses in homemaking and their relation to the community, the methods of teaching nutrition in the school.

2. Subject matter courses: economics, educational sociology, household science, clothing and design, home decoration, home management, food study, the school lunch problem.

Practice classes were conducted in connection with several of the courses. A voluntary class of high school girls met twice a week at Kenmore, the regular practice center in connection with the winter session. This class was used for demonstrating both the class and home project method. A practice class of 25 women from the county Home Bureau was used in connection with the evening school class. A group of eight Italian women at Mt. Carmel Guild was used as a practice class in teaching the correlation of English and homemaking. Each student enrolled in the course was responsible for one lesson. The group of Italian women became so interested that a teacher was secured to carry on the work after the course closed at the Normal School.

Nutrition classes were organized in Buffalo Public Schools and Memorial Chapel Settlement as part of the course offered in the organization of nutrition work in the public schools.

In developing the part time education classes, arrangements were made with several commercial and industrial establishments for occupational study. A round table conference was held with several employment managers.

The cafeteria was used as a laboratory for the lunch room course. From 300 to 400 people were served daily. Cafeteria service was maintained for the students, and dining room service for the faculty.

The practice house was occupied and used as a laboratory for the home management group.

Special lectures of both general and specific interest were held each afternoon at 3 o'clock.

A Household Science Exhibit was arranged, and electrical applicances of interest to the homemaker were displayed and demonstrated. Fifteen firms coöperated and $2300 worth of equipment was loaned for the exhibit.

Health in the Home. The Home Economics Association of Greater New York assumed the responsibility of arranging and presiding over two booths which were taken by the American Home Economics Association, at the Public Health Exhibition, held at the Twenty-Third Regiment Armory, Brooklyn, N. Y., Oct. 7–14, 1922.

Mrs. Margaret Loring Thomas, chairman of the committee, was assisted by Elizabeth Condit, Lucy Gillett and Grace MacLeod.

A collection of primitive cooking utensils, used by American Indians, loaned by the American Museum of Natural History, formed an interesting historical background for the educational side of the exhibit. It incidentally proved a very effective way of getting in touch with small boys and men.

Conversation about "things the Indians cooked in" could very quickly be turned to "things good for boys and girls to eat." The latter were very strikingly illustrated by posters made by the pupils of the Public Schools of Brooklyn and New York, hung on the wall back of the Indian utensils.

A kitchen cabinet with an outfit of modern utensils aroused the interest of housekeepers. A model breakfast, dinner, and supper for a twelve year old girl, also loaned by the American Museum of Natural History, set on a small serving table near the cabinet, appealed to the spectator from another point of view. The composition of the foods served in the model meals was illustrated by vari-colored blocks of wood.

Dr. Langworthy's charts and a collection of Government Bulletins held the attention of the intelligent passer-by. A number of men evidently heads of families, asked to have copies of some of the bulletins obtained for them.

Fifty-two lantern slides were automatically displayed, in rotation, in a stereomotograph, loaned by the Department of Health. The slides were selected from among those owned by the Department of Health and the Museum of Natural History. "Health in the Home" was the feature of this part of the exhibit. Many of the slides were attractively colored, some showed children eating, going to school, and being weighed; others showed clean cows and good milk supply; others the composition, food value, and cost of foods. Dr. Mendell's rats appeared in the slides as graphically as ever.

There was a hostess for every day, each one emphasizing her personal reaction. Mrs. Jenoise B. Short, President of the Home Economics Association of Greater New York, represented Home Economics in journalism; Mrs. Thomas, the importance of home economics training for the homemaker; Elizabeth Condit, of Pratt Institute made a plea for the study of home economics through literature and the greater use of libraries; Alma J. Finlayson, President of the Association of Home Economics Teachers of the New York City Elementary Schools, explained the work done in the Public Schools; Day Monroe and students from Teachers College were present to give the latest news of the progress being made in nutrition and public health work.

Over 50,000 people attended the exhibit.

OHIO

The Ohio Home Economics Association held the October meeting in Dayton, October 7. The topic for discussion was "Scientific Feeding of the Public." Bertha Hyde spoke for the hospital dietitians, Helen Sawyer for the managers of tea rooms, and Agnes Ludman told of the possibilities of the school lunch. Mr. John Willy, Editor of the Hotel Monthly told of the activities of trade journals in the interest of nutrition.

The December meeting will be held in Columbus, December 27. The subject will be Art in Home Economics.

Ohio State University. A course called Child Care is to be offered to senior students in home economics. An attempt is being made to include, not only the physical care of the child, but also a study of his mental characteristics and development, his place in the family, and the responsibility of society for the child. Obviously, with so inclusive an outline, the subject must be treated in survey style to give viewpoint rather than a mass of detail. The course will be taught by various specialists. Interesting plans are being developed for observation and experience.

TEXAS

College of Industrial Arts. The completion of ten rooms in the Household Arts Building, for the use of students in the department, establishes a milepost of progress and indicates the lines along which Texas is developing education for women.

Two new foods laboratories and a third dining room for meal service relieve the present laboratories, of which there are four devoted to food work. The new dining room permits of increase in lessons in actual meal service. The new laboratories, in addition to providing for more classes are so equipped as to provide enlarged opportunities in many directions. The meal

service laboratory equipment includes a steam table and especially constructed cupboards and tables. The other food laboratory is equipped with four unit kitchens and has many special features planned by the faculty of the department.

A drying room has been installed for wet towels. Each instructor will regulate the supply for her classes. Additional storage room has been provided to relieve congestion. A reception room has been furnished for use in connection with the dining rooms.

There are three new laboratories and a work room for students in domestic art. Built-in lockers and large closets are features of the millinery laboratories. Power machines for advanced classes in clothing, and other up-to-date appliances afford opportunity for work of high grade.

NOTES

Dorothy Arnold, Instructor in Applied Art, University of Missouri, has been given a leave of absence for special study.

Virginia Bauer, who has been instructor at the University of Chicago for the last year has been elected instructor in the University of Missouri.

Zella E. Bigelow, who in June resigned per position as Associate Professor of Clothing, University of Idaho, was married August 30, to Dr. Thompson, a member of the Law Faculty of the University of Macon, Georgia.

Ida Carr who assisted in vocational work in Nebraska last year was married this summer to Mr. N. L. Tyson.

Eloise Davison has resigned as Household Management Specialist at Ohio State University to accept a position in the Home Economics Department at Iowa State College.

Marie Fuller is head of the home economics work at Pine Manor, Mass.

Agnes Ellen Harris, formerly Field Agent in the States Relations Service, U. S. Department of Agriculture, is now Dean of Women at the Alabama Polytechnic Institute and State Home Demonstration Agent.

Rachel Harris, millinery specialist with the Home Economics Extension Service in Nebraska, was married this summer to Mr. Robert Cunningham of Janesville, Wisc.

Hallie E. Hyde, for the past eight years, Associate Professor of Foods, University of Idaho, is spending a year in Honolulu.

Lillian Jeters and **Lemo Dennis** of Nebraska Wesleyan spent the summer in New York attending Teachers College, Columbia.

Lonny Landrum, District Home Demonstration agent of North Florida has accepted the position of Conservation Specialist in South Carolina.

Ellen Lenoir has been appointed as Miss Landrum's successor.

Alice Loomis, who has been State Supervisor since the organization of vocational work in Nebraska, is now giving all of her time to the development of home economics in the part-time and evening schools and to assisting with the development of trade and industrial education in the state.

Hughina McKay who received her Master's Degree last summer at the University of Chicago, has accepted a position on the Home Economics Staff at Ohio State University.

Elizabeth W. Miller of Iowa State College is now Mrs. Koch and is again associated with the Home Economics Department of the University of Chicago.

Margaret Sandels has been appointed acting Dean of Home Economics at Florida State College for Women.

Hannah Stillman, who did graduate work at the University of Missouri last year has been added to the staff as instructor in dietetics.

Miss Tracy has accepted the position of dietitian at Florida State College for Women.

Birdie Vorhees, formerly of Oklahoma A. & M. College, is State Supervisor of Home Economics in the Day Schools in Nebraska.

Mildred Weigley of the University of Minnesota was married to Mr. Henry C. Wood of Phoenix, Arizona.

Bertha Whipple, Assistant Professor of Home Economics, University of Missouri, has been granted a leave of absence to do special work as dietitian in the American Hospital, Stamboul, Constantinople.

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